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THE

Pharmaceutical Journal

AND

Transactions.

The Pharmaceutical Journal

AND

Transactions.

THIRD SERIES.

VOLUME XIII.

1882-83.

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The Pharmaceutical Journal AND Transactions.

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Papers intended to be read at that Meeting should be forwarded to the Secretary not later than Wednesday, January 31st, as papers received after that date cannot be announced in the *Pharmaceutical Journal* previous to the Meeting.

MAJOR, MINOR AND MODIFIED EXAMINATIONS.

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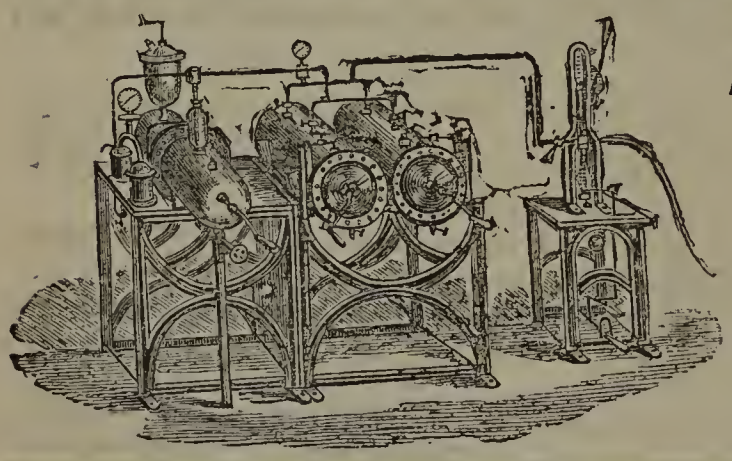

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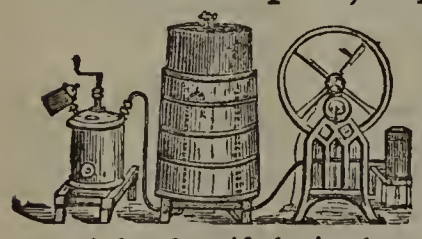

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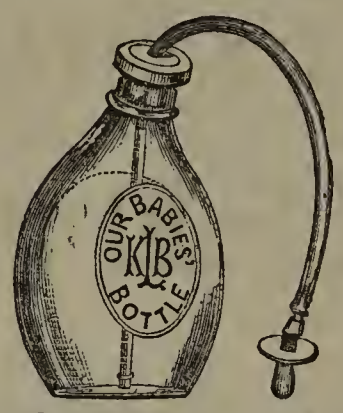

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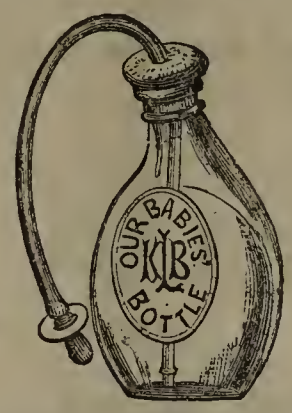

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THE ORIGINAL AND ONLY GENUINE.

IMPORTANT CAUTIONS

From Lord Chancellor SELBORNE, Vice-Chancellor Sir W. PAGE WOOD, and the LORDS JUSTICES of APPEAL.

VICE-CHANCELLOR SIR W. PAGE WOOD, by whom the suit in Chancery was first heard, stated, in his judgment, that "Dr. J. Collis Browne was undoubtedly the Inventor of Chlorodyne, that the whole story of the Defendant Freeman was as deliberately untrue as the falsehood he had deposed to with reference to the use of his Chlorodyne in the Hospital."

THE VICE-CHANCELLOR also stated, "that Chlorodyne was a fanciful name, and had application been made sooner, the Court would have given Dr. Browne protection."

LORD CHANCELLOR SELBORNE coincided with the judgment of the Vice-Chancellor upon this point, and stated "that had application been made at a proper time and place, the Court would have found means to restrain the Defendant from misrepresenting the decision of the Vice-Chancellor."

LORD JUSTICE JAMES on appeal stated, in his judgment, "that the Defendant Freeman had made a deliberate misrepresentation of the decision of Vice-Chancellor Wood."

It was proved in Court, on affidavit by Mrs. Forbes, of Paris, that the testimonial published in the *Times*, November 14th, 1865, speaking of the great efficacy of Chlorodyne in Cholera referred to Dr. J. Collis Browne's Chlorodyne, and that she never used any other, that she had written to the Defendant Freeman to that effect, notwithstanding which notice the Defendant publishes the said testimonial as referring to his medicine.

The Editor of the *Medical Times*, in his report on Chlorodyne, January 13th, 1866, gives information that the Chlorodyne referred to was the medicine introduced by a retired Army Medical Officer, which was Dr J. Collis Browne, still this is published by the Defendant as testimony to his medicine.

Numerous affidavits from eminent Physicians and others were produced in Court, stating that Dr. J. Collis Browne was the inventor of Chlorodyne, and that when prescribing they mean no other.

The Defendant himself publishes that his compound is in effect and composition quite different to any other preparation, nevertheless he assumes the name, testimonials, &c., of Chlorodyne.

Technicalities in law prevent that protection which the public should justly have against such a course of conduct. It is now incumbent on all who purchase Chlorodyne to see that the name, "Dr. J. Collis Browne's Chlorodyne," is engraved on the Government Stamp, as it is not sold otherwise. All other compounds under the name of Chlorodyne are spurious. All attempts at analysis have failed, hence the statement that the constituents of Chlorodyne are known is a misrepresentation.

FURTHER IMPORTANT NOTICE.

From SYMES & Co., Pharmaceutical Chemists, Medical Hall, Simla.—*January* 5, 1880.

To J. T. DAVENPORT, Esq., 33, Great Russell Street, Bloomsbury, London.

DEAR SIR,—Have the goodness to furnish us with your best quotations for Dr. J. COLLIS BROWNE'S Chlorodyne, as, being large buyers, we would much prefer doing business with you direct than through the wholesale houses. We embrace this opportunity of congratulating you upon the wide-spread reputation this justly-esteemed medicine has earned for itself, not only in Hindostan, but all over the East. As a remedy of general utility we much question whether a better is imported into the country, and we shall be glad to hear of its finding a place in every Anglo-Indian home. The other brands, we are happy to say, are now relegated to the native bazaars, and, judging from their sale, we fancy their sojourn there will be but evanescent. We could multiply instances, *ad infinitum*, of the extraordinary efficacy of Dr. COLLIS BROWNE'S Chlorodyne in Diarrhœa and Dysentery, Spasms, Cramp, Neuralgia, the Vomiting of Pregnancy, and as a general sedative, that have occurred under our personal observation during many years. In Choleraic Diarrhœa, and even in the more terrible forms of Cholera itself, we have witnessed its surprisingly controlling power. We have never used any other form of this medicine than COLLIS BROWNE'S, from a firm conviction that it is decidedly the best, and also from a sense of duty we owe to the profession and the public, as we are of opinion that the substitution of any other than COLLIS BROWNE'S is a deliberate breach of faith on the part of the chemist, to prescriber and patient alike.

We are, Sir, faithfully yours,
SYMES & CO.,
Members of the Pharmaceutical Society of Great Britain,
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After these public statements in a Court of Equity, and subsequent confirmation by the trade at large, no Chemist can conscientiously use or sell any other compound for Chlorodyne, without committing a breach of faith unjust to patient and physician. The value of the remedy *alone* creates the great demand.

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Professor Yandall, M.D., of Louisville, U.S.A., reports of it:—"The Kepler Extract of Malt is the best, and has the finest flavour of any I have seen; it is a very valuable preparation."

"The Medical Times and Gazette," says of it:—"The Kepler Extract of Malt is deserving special commendation. It is, we venture to say, by far the best we have seen. *The one most widely known and most largely used in this country.*"

"The Medical Press and Circular" in reporting upon the subject says:—"The Kepler Extract of Malt is reliable, and is manufactured in such a careful manner as to ensure the preservation of its valuable constituents. It is very delicious to the taste, and has been found by analysis to be exceedingly rich in diastase, and consequently is a valuable digestive agent.

The Kepler Malt, combined with Cod Liver Oil, is the most palatable and easily digested of any form we have yet seen for administering Cod Liver Oil."

Burroughs, Wellcome & Co., Manufacturing Chemists, 7, Snow Hill, London, E.C.

The Pharmaceutical Journal.

SATURDAY, JANUARY 6, 1883.

Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

1882.

THE year that has just closed has not, in its pharmaceutical aspect, been marked by any very stirring events. But even in this it may be said to have had an advantage over its predecessor; for if it has brought no International Congress, neither has it seen the retirement of honoured leaders or the frustration of carefully elaborated schemes for the improvement of the conditions under which pharmacy is practised in this country. On the contrary there has been a decided improvement in the general position, and the close of the year finds the Council engaged, at the request of the Government, in formulating its views as to amended legislation in the interests of pharmacy as well as of the public.

The Council of the Pharmaceutical Society, which may fairly claim to be by far the most important executive body in relation to all that pertains to pharmacy in this country, has not undergone any change in respect to its members during the past year. The fourteen gentlemen who, according to the bye-laws, retired from the Council in May were nominated for re-election, and were all returned by considerable majorities. At the first meeting of the new Council in June, the choice of officers for the ensuing year was made. Mr. THOMAS GREENISH, who for two years had filled the post of President with a success indicated by the fact that at the end of each year he had headed the poll in the election of members of the Council, retired from the chair, and his place was taken by Mr. MICHAEL CARTEIGHE. Mr. GEORGE FREDERICK SCHACHT, who for three successive years had been chosen Vice-President, gave up that post to Mr. SAMUEL RALPH ATKINS; whilst Mr. JOHN ROBBINS was again requested to act as Treasurer.

The Registrar's Report, which was presented as usual to the Council in February, showed an increase of 193 in the number of names on the Register of Chemists and Druggists. In contrast to this there was a decrease of 29 in the total number of persons connected with the Pharmaceutical Society as members and associates. This retrogression, and the fact that it was mainly due to a decrease in the class of Pharmaceutical Chemist Members, naturally formed the topic of some conversation at the Council, and it gave rise outside to some ill-concealed jubilation as to "the decay of the Pharmaceutical Society." That this assumption was somewhat premature is shown by the fact that the gross number of members and associates still reached 4607, a total that had only been exceeded in the previous year.

Amongst the earliest business that came before the Council last year was a motion of Mr. RICHARDSON to rescind some regulations passed in 1879, as to the conditions under which reporters should be allowed to attend the meetings of the Council. The general effect of the motion was to place all press reporters who mightatt end upon an equal footing, and to remove a somewhat anomalous distinction which had its origin in a desire to confer upon the representatives of another journal privileges we were erroneously supposed to enjoy. The Council also resumed the right to allow its own reporter to be present for the purpose of taking notes during the transaction of private business in committee, a right which, as Mr. RICHARDSON frankly admitted, had been relinquished under the temporary misapprehension that this reporter attended on behalf of the *Pharmaceutical Journal.* The fact is, as has been stated many times, the reports of the Council proceedings published in this Journal are the official reports, supplied under the authority of the Council itself. After the experience of the last three years it may be fairly assumed that they correctly represent all that portion of the business which the Council feels at liberty to transact in public. In addition to this, the Council, at its meeting in May, on the motion of Mr. RADLEY, passed a resolution authorizing the President for the time being to publish in the Society's Journal and Transactions so much of the proceedings of the General Purposes Committee as he might deem desirable.

Notwithstanding the wide-spread discontent that exists among those legally entitled to carry on the business of chemist and druggist, and their almost unanimous agreement that the emoluments arising from it are insufficient to repay the expenditure of time and money involved in securing the necessary qualification, there does not yet appear to be any indication of a falling off in the number of persons desirous of acquiring the right to practise pharmacy. The total number of candidates who came up at the different examinations during the year amounted to 2030, being 73 in excess of those of the previous year, and 13 more than in 1880. Taking first the initiatory stage, the number of candidates at the four Preliminary examinations reached 1269 against 1187 in the previous year. Of these 629 were successful; this represents 49·5 per cent. of passes, which is a result more satisfactory than in the previous year when only 512 or 43·1 per cent. passed. The number of certificates received in lieu of the Society's examination was only 50, showing a falling off as compared with the

year 1880; but the net result was that 679 apprentices were registered, being 82 more than in the previous year. The number of candidates for the Minor examination was 650, or exactly the same number as in 1881, and two less than in 1880, so that very little variation is manifest in the numbers coming up for the qualifying examination. There has been, however, a very considerable falling off in the percentage of passes in this examination, for whereas in 1881 they equalled exactly 50 per cent., last year they only amounted to 286 or 44 per cent., showing a larger proportion of failures than has occurred in any year except 1874 since the passing of the Pharmacy Act in 1868. The number of candidates who presented themselves for the Major examination also was almost the same as in 1881, having been 103 against 107; but of these, too, a much larger proportion failed and only 40, or 38·8 per cent., passed and became entitled to registration as pharmaceutical chemists. Only 8 persons presented themselves for the Modified examination, and of these 5 passed.

The examinations and their relation to pharmaceutical education have again occupied a large share of the attention of the Council. The very large proportion of failures in the Preliminary examination in January induced Mr. Borland to raise the inquiry whether the questions in arithmetic had not been more difficult than usual, and Mr. Young suggested whether it might not become desirable to appoint a committee to watch the examination papers with a view to checking undue stringency. Undoubtedly the large proportion of failures in arithmetic which occur in the Preliminary examination, and which in 1881 nearly quadrupled the proportion of failures in Latin, is a very remarkable feature; but as the questions are always published, and this particular subject is one that does not admit of much variation of opinion in awarding marks, any person interested in the subject has an opportunity of forming his own judgment upon the subject. Still, we think that there will be a general agreement with an opinion expressed by Mr. Walter Hills, at the Council meeting in October, that the arithmetical questions set are not of such a nature as to explain this result, and that in a pharmacist's daily business questions quite as difficult often occur, so that a person unable to obtain 40 per cent. of marks in arithmetic in this examination would scarcely be qualified to dispense prescriptions. Unfortunately there can be little doubt that Dr. Greenhow, in his report to the Privy Council, correctly attributed the large number of rejections to the very inadequate early education of the majority of the candidates; it is to be hoped, therefore, that in an increasing proportion of cases this test may be applied before pupils have wasted some years of their lives in a calling for which they do not possess the elementary scholastic qualification. Evidently, however, there exists some difference of opinion among chemists and druggists as to the standard that should be adopted for this examination, and the Society may be congratulated that the questions are now set by an impartial body like the College of Preceptors. From this point of view interest attaches to a communication which was received in August from the honorary secretaries to the Oxford and Cambridge Schools Examination Board, in reference to an examination which it is intended to institute in connection with schools throughout the country, and asking if certificates granted in respect to it would be received in lieu of the Preliminary examination. Some points in the scheme gave rise to objection, but the general spirit of it was approved by the Council, and there is no doubt that the establishment by such unimpeachable authority of a standard that shall represent what may be considered a fair test of a sound middle-class education would be a great boon.

In December the subject of the Preliminary examination came again under the consideration of the Council in connection with a special recommendation contained in a report from the Board of Examiners in England. It was to the effect that the time allowed should be extended from one hour to one hour and a half for each of the three subjects, with an interval of one hour between the second and the third; also that instead of the examiners being limited to the first book of Cæsar for their selection of one passage for Latin translation, they should be at liberty to set two passages, one from one of the first two books of Cæsar's 'De Bello Gallico,' and the other from one of the first two of Virgil's 'Æneid,' the candidate only to be required to translate one of the passages, and notice to be given a year in advance as to the books from which the selections would be made. An objection was raised, however, representing the views of the Board of Examiners in Scotland, that the extension of the ground of selection to two books of each author would have the effect of unduly increasing the difficulty of the examination. Accepting the suggestion as to the increase in time allowed, the Scotch Board desired that in respect to Cæsar the examination should be still limited to the first book, and that, if Virgil were introduced, only the first book of that author should be used. After a discussion, an amendment in accordance with the views of the Scotch Board was carried by a bare majority of the Council, and future candidates for the Preliminary who have studied Virgil rather than Cæsar will, therefore, have an easier task and a longer time to perform it in.

But the interest of the Council in the examinations has been by no means confined to the Preliminary, and it appears probable that one of

the results of the past year's labour has been to bring more clearly within the range of probability the establishment of a curriculum to be followed as an indispensable portion of the education of pharmacists in the not very remote future. In March a Special Committee on the relation to each other of pharmaceutical education and the pharmaceutical examinations, to which a preliminary report had been referred for the working out of details, laid the result of its labours before the Council. The fresh report fully endorsed the first two recommendations of the previous one, to the effect that candidates for the qualifying examination should be required to produce evidence of apprenticeship or pupilage of not less than three years, and that the Preliminary examination or its equivalent should be passed before the time spent in such pupilage should be allowed to count. The third recommendation, that the candidate should be required to produce evidence that he had attended since the date of his Preliminary examination a course of lectures on chemistry, one on botany, and one on materia medica, was also endorsed and a syllabus of the course of lectures on each subject was submitted. With respect to the authoritative recognition of such lectures and teaching the Committee recommended that the Council should, at its discretion, recognize and accept certificates from those public schools of science, the responsible authorities of which shall satisfy it that their scope of teaching includes the points enumerated in the syllabuses, or certificates from other schools in which it is shown that the teaching is of sufficient excellence and of the nature required. With respect to the fourth recommendation the Committee recommended an important modification of that in the previous report. It was still proposed that the Minor examination should be divided into two parts, between which it was suggested there should be an interval of not less than six months; but it was now recommended that the first portion, including the translation of prescriptions, pharmacy and theoretical chemistry, should be entirely a written examination and should be conducted under suitable regulations in London, Edinburgh, and certain provincial centres to be agreed upon by the Council. It was recommended that persons passing this portion of the examination should not receive a certificate, but should be entitled to present themselves, after an interval of not less than six months, for the second portion of the examination, which should be essentially *vivâ voce* and experimental, conducted in London and Edinburgh only, and consist of chemistry and practical chemistry, botany, materia medica and practical dispensing. Finally it was recommended that these regulations should come into operation on the 1st of January, 1886. The discussion of the report was postponed until the meeting in the following month, and a copy was ordered to be supplied to each member of the Council for consideration meanwhile.

In April, accordingly, the subject was brought formally under the consideration of the Council, upon a motion made by Mr. SCHACHT, and seconded by Dr. SYMES, that the recommendations of the Committee should be approved. The first three recommendations, as to pupilage, the Preliminary examination, and a curriculum, were again endorsed with great unanimity; but the modifications introduced into the fourth were sharply criticized. Granting the desirability of the division of the Minor examination into two parts, Mr. HAMPSON opposed the suggestion that there should be an interval of six months between them, as well as the rearrangement of subjects, and especially the proposition that the first portion should be conducted at provincial centres. In one or other of these objections he was supported by a majority of the members of Council, among whom were the President (Mr. GREENISH), Mr. WILLIAMS, Mr. BOTTLE, Mr. YOUNG and Mr. BORLAND. On the other hand the report was defended by the Vice-President (Mr. SCHACHT), Mr. CARTEIGHE, Dr. SYMES, Mr. ATKINS and others, it being argued that the interval and the local examinations were advisable in the interest of the candidates, whilst the placing of the theoretical subjects before the technical was the logical course, since after a candidate had satisfied the examiners as to his practical ability the prolongation of his scientific studies could not be so well demanded in the interest of the public. After a long debate an amendment to adopt the first three recommendations was carried unanimously, but a motion to adopt the fourth recommendation was lost by a majority of one. The fifth recommendation, as to the time when the new scheme should come into force, was therefore necessarily dropped; indeed it almost seemed as if some of the chief advocates of the scheme, in seeking to secure a minor point, had brought the whole movement to a dead-lock.

At the second meeting of the new Council, in July, however, the recommendations again underwent a long discussion. Mr. SCHACHT moved that a Committee should be appointed to consider and report upon the best method of giving effect to the resolution of the Council in April, and he pointed out that one of the first duties of such a Committee would be to inquire how far the present legislative power would enable the Council to carry it out. But the motion also included an instruction to the Committee to report any suggestions it might desire to advance as the result of its deliberations, which provoked considerable opposition, and Mr. HAMPSON moved its omission on the ground that it would probably reopen the question upon which the Council had already come to a decision. On the other side it was argued that the manner in

which the Minor examination should be conducted would necessarily have to be considered by the Committee in connection with the third recommendation, which had been adopted, and that even without such an instruction the rejection of one plan would not have precluded the Committee from suggesting another; it was also pointed out by the President, Mr. CARTEIGHE, that the striking out of the instruction after it had been inserted might be construed as an indication that the Council wished to fetter the Committee in its deliberations. So evenly were opinions balanced upon this point that upon a division an equal number voted on each side, and the President having given his casting vote against the amendment, the motion of Mr. SCHACHT was afterwards carried by a majority of one.

It may be safely said that besides the prominent position this future of the qualifying examination has occupied in the deliberations of the Council it has given rise to more talking and writing than any other pharmaceutical topic during the year. Besides being discussed at the General Meeting of the Society, it has permeated presidential addresses, been the occasion of several meetings in the provinces, called forth special memorials to the Council, and provoked a mass of correspondence. Of course there has been diversity of opinion manifested, but the preponderance has been decidedly in favour of the establishment of a curriculum, which denotes a healthy recognition of the fact that such a course would not make the qualifying examination more stringent, but would lessen the proportion of rejections by promoting the better education of those who are to be examined. Among the expressions of opinion to which adventitious circumstances lend an additional importance, is that of Dr. GREENHOW, the Government Visitor at the examinations, who, in his last official report, whilst deferring detailed comments on the scheme as a whole, expressed his decided approval of the first two recommendations. Another occurred in a letter from Dr. W. B. CARPENTER, who, after many years' experience as Registrar at the University of London, considers that the regulation under which the attainment of medical degrees at that University is made exceptional by restrictions as to the mode in which candidates shall study is a wise one, and that a similar course should be followed with respect to candidates for a qualification to practise pharmacy. Again, Mr. ALEXANDER NAPIER, speaking as President of the North British Branch, two months ago, said, that no one could doubt that a course of compulsory and systematic instruction in theoretical chemistry, botany and materia medica, with practical instruction in chemistry, would be the best means of insuring thoroughly intelligent agents for the practice of pharmacy, and that the time must come when pharmaceutical students will have to devote a certain period exclusively to scientific education, since the present system, or no-system, of having an engagement in a pharmacy and attending lectures and studying in bye hours, is unsatisfactory to both employers and students. But perhaps one of the most encouraging expressions of opinion on the subject, outside the Council, took place at the Annual Meeting of the Trade Association, when a motion to the effect that at the present time it is not desirable to establish a curriculum was rejected by a majority of nearly three to one. It therefore appears evident that there has been recently a considerable development of opinion in favour of the adoption of a compulsory curriculum as a means of ensuring the systematic education of intending pharmacists, and it does not seem unreasonable to attribute this, in part at least, to the stimulus received through contact with pharmacists of other countries during the International Pharmaceutical Congress in 1880. Be that as it may, the hands of the Council will be strengthened by the knowledge that it has the support of the majority of pharmacists in respect to the principles laid down, and in working out the details it will no doubt bear in mind all the pecuniary and other interests involved, in which its own members are as much concerned as any.

Many circumstances combined early in the year to concentrate more public attention than usual upon the regulations under which dealings in poisons and preparations containing poisonous medicines are conducted. Especially some circumstances attending a case of criminal poisoning by means of aconitine, and representations made by coroners as to the numerous fatalities resulting from the use of preparations containing poisons which are now so widely sold under the cover of the patent medicine stamp, compelled the Government to take some action in deference to public opinion. Towards the end of January, the Director of Public Prosecutions took legal proceedings against the proprietor of one of the most notorious of these preparations, on the charge of having sold "solution of chloral" without affixing a poison label to the bottle in which it was contained. The case rested on the sale of two bottles of the solution, one of them containing equal to 284 grains, and the other 88 grains of chloral hydrate, and it was deposed that a dose of 30 grains—which would be exceeded in a teaspoonful and a half of the solution—had been known to prove fatal. On the part of the prosecution, it was argued that the exemption contained in the sixteenth section of the Pharmacy Act, 1868, in favour of "the making or dealing in patent medicines," only applied to the provisions "hereinbefore contained"—*i.e.*, the first fifteen sections of the Act—which restrict dealings in poisons to registered chemists and druggists, and that it does not relieve any seller of a scheduled poison from the necessity of complying with the

provisions as to labelling, etc., in the seventeenth section. For the defence it was broadly contended that by the words in the sixteenth section, patent medicines are entirely withdrawn from the operation of the statute, and that this reading had the sanction of custom. The magistrate, however, decided against the defendant, though somewhat ambiguously, "on the larger word 'poison,'" because he thought the solution was a poison on the medical evidence, and he imposed a penalty of 40*s.* and costs. Notice of appeal was given at once; but it is instructive to note that it has never been carried out, neither has the Public Prosecutor shown any signs of following up his success by further proceedings in the same direction.

Before turning to the subject of projects for fresh legislation in respect to the sale of poisons, mention must be made of a signal failure in an attempt to extend the scope of the present law. It will be remembered that in the parliamentary session of 1881 a Bill was introduced to amend the law as to the sale of poisons, especially in relation to their administration to animals, which, if passed, would have caused much inconvenience and added largely to the list of scheduled poisons. The Bill was, however, withdrawn in deference to the wish of the Council of the Pharmaceutical Society, to give an opportunity for conference with the promoters. As a result, in February last, the Council resolved to exercise its statutory powers, and to recommend to the Privy Council the addition to the second part of the poison schedule of sulphuric, hydrochloric and nitric acids, butter of antimony, carbolic acid, hellebore, nux vomica and its preparations, and vermin killers containing phosphorus. After an unusually long interval, probably taken up in communicating with representatives of classes that would be affected by such a course, a communication was received in August from the Privy Council Office, containing a copy of an Order in Council by which nux vomica and its preparations were added to the second part of the schedule of poisons, and intimating that, pending the consideration of the expediency of further legislation with respect to the sale of poisons, their Lordships did not deem it desirable to add to the restrictions on the sale of the acids and other articles mentioned in the resolutions of the Council.

In March, in accordance with a promise made in reply to a question put in the House of Commons, the Home Secretary caused a communication to be sent inquiring whether the Pharmaceutical Society had any suggestion to make for the amendment of the law relating to the sale of poisons. In reply, and after consultation, the President (Mr. Greenish) forwarded to the Home Secretary three definite suggestions as embodying the opinion of the Council. These were to the effect (1) that further restrictions on the sale of medicine containing poison, dispensed from ordinary prescriptions, are not necessary or practicable; (2) that the sale by wholesale of certain virulent poisons,—such as the poisonous vegetable alkaloids,—might with advantage be placed under greater restrictions; and (3) that the sale of patent medicines containing poisons should be placed under the same restrictions as the sale of other medicines containing poisons. It was also mentioned that the amendment of other sections of the existing Acts seemed desirable. In compliance with a wish expressed by Sir William Harcourt at an interview which took place subsequently between himself and the President and other members of the Council, these suggestions were afterwards amplified. The restriction on wholesale transactions proposed was that sales of poisons in the first part of the schedule should be recorded as to name of poison, quantity, name and address of purchaser and date of sale, and that the record should be kept twelve months. With respect to patent medicines, it was proposed that so much of section 16 of the Pharmacy Act, 1868, should be repealed as allows patent medicines to be sold without restriction, and to enact that all such medicines containing poisons should bear a notice to that effect and a warning that they should be used with care. The propriety of enforcing a certain course of technical education and training, prior to the qualifying examination of persons who are to be registered as authorized to sell and dispense poisons and poisonous medicines, was also urged in regard to the safety of the public. It would appear most probable, however, that any legislation on this subject undertaken by the Government will emanate from the Privy Council, and it is satisfactory to find that the postponement of the additions to the poison schedule proposed by the Privy Council "pending the consideration" of the subject was not meant as an empty phrase. Immediately after the summer vacation a request was transmitted from the Lord President that the Pharmaceutical Society would submit its views in regard to the sale of poisons, for the consideration of the Lords of the Council, in the form of a draft Bill for amending the existing law, and it will be seen from the report on another page that the Law and Parliamentary Committee is at present busily engaged on the work.

The Royal Commission on the Medical Acts, the appointment of which last year was the occasion of considerable discussion, if not anxiety, amongst pharmaceutical politicians, was published in June, but so far from presenting any features of special interest to pharmacists, such topics were only remarkable by their absence.

In August the subject of reciprocity in the recognition of certificates of qualification granted by colonial pharmacy boards was revived by the reception of a letter from the Pharmacy Board of Victoria. In this communication, it was stated that

the course of study required by the Victorian Pharmacy Act is nearly identical with that required for the Major examination in this country, and it was urged that since the exemption from examination of holders of the British qualification is especially provided for in the Colonial Act, it would be equitable that there should be some recognition of the Victorian certificate in this country. The evident feeling of the Council in respect to this application was that at present it has no power to accept such certificates of qualification and that the time has not yet come when it would be justified in applying to Parliament for such power, since it would be difficult to draw the distinction between one colony and another. A significant commentary upon this decision has been furnished by the resolution of the Pharmacy Board of Victoria itself not to recognize the certificates of qualification issued by the Pharmacy Board of the neighbouring colony of New Zealand, and some of the incidents arising out of the resulting controversy between the two colonial Boards have not been devoid of the humorous element.

The disposition of different Government departments to consult the Council of the Pharmaceutical Society upon subjects connected with the practice of pharmacy in all parts of the British empire is evidently increasing. Besides the communications from the Home Office and the Privy Council Office, before referred to, there was in May transmitted to the Council a copy of an Ordinance of the Legislature of St. Lucia, for the regulation of the sale and dispensing of drugs and poisons in that colony, asking that it might be considered, and that the Secretary of State for the Colonies might be furnished with the views of the Council respecting it. The request was complied with and some alterations were suggested.

It may be here mentioned that, mainly through the efforts of Mr. Crossley, an Associate of the Pharmaceutical Society, two Ordinances have been passed regulating the dispensing of medicines and the dealing in poisons in the Island of Guernsey, by which the practice of pharmacy in that island, after saving the rights of those engaged in business at the time, is confined to persons holding the diploma of the Pharmaceutical Society of Great Britain or of one of the French faculties.

At the meeting of the Council in November the subject of the public sale in London by auction of spurious and worthless drugs was brought forward by Mr. Williams, who moved that a Committee should be appointed to consider the question and report to the Council what steps, if any, should be taken to check this practice. There was a decided feeling amongst the members of Council as to the necessity for caution in dealing with this subject, and a disinclination to assume the position that pharmacists are incapable of protecting themselves and the public from those practices without State aid. A similar feeling was manifested at the Evening Meeting in December, when the subject was brought forward in a paper read by Mr. E. M. Holmes. The Committee was appointed, but has not yet made a report.

Whatever else in connection with pharmacy may have been sluggish during the year benevolence has been active, and notwithstanding that pharmacists number among themselves a large share of the poor they have nobly striven to render to them adequate aid. Early in the year there were some indications of a falling off in the number of subscribers and that the Council would be left with a diminished income to meet increasing requirements. The subject was, however, taken up vigorously in the Council, and a resolution was passed expressing an opinion that the number of subscriptions would be much increased if a personal canvass were made by each Local Secretary, accompanied by one or more members of the trade. It was also resolved that with a view to facilitate this work a complete list of all the subscribers should be published annually in this Journal and that a copy of the number containing the list should be sent to every person whose name is on the Register of Chemists and Druggists. The response from Local Secretaries and others interested throughout the country has been very satisfactory, and as a result the year's subscriptions amounted to the sum of £1568, being £383 in excess of the sum received in 1881; besides which the unusually large amount of £388 was received in donations. Of the donations the sum of £100 was given by the Treasurer, Mr. Robbins, to be invested in gas shares, on the condition that the dividends should be applied in paying £5 each year to the annuitant who has contributed the largest amount to the Benevolent Fund. Donations of £50 each were also given by Mr. J. Richardson and Mr. E. N. Butt. There was a further accession to the Fund in the shape of three legacies of £100 each, under the wills of Mr. Arthur Lloyd, of Camden Square, Mr. Robert Howden, of Gracechurch Street, and Mr. Charles James Pearson, of Swansea. On the other hand the expenditure in the shape of annuities amounted to £1187 10s., and in casual grants to £461. Last month six fresh annuitants were elected, which brought the number up to forty-two, involving an expenditure of £1360 per annum.

Great attention has been paid during the year to the Library and Museum by the Committee charged with the task of keeping them in a state of efficiency. About 500 books and pamphlets have been added to the Library, and it is satisfactory to find that evidence of the esteem in which it is held has been afforded by a considerable increase in the number of persons using it both in the day-time and in the evening, the numbers having been, day, 4218, evening, 1510, against 3447 and 1249 in the previous year. This may be partially attributable

to the increased number of students in the School of Pharmacy, but it is also noticeable that the circulation of books has been almost the same as in 1881, although that the Library was closed during the whole of September for cleansing purposes.

The Herbarium has been increased by a valuable series of medicinal plants from the Botanical Gardens at Ceylon; also by an excellent set of specimens of various species of aconite and by specimens of the plants yielding damiana and Japanese oil of peppermint. The collection of materia medica has been enriched by numerous contributions, notably by specimens of new alkaloids from Messrs. MERCK, by a tolerably complete series of the cuprea barks from various donors, by a number of Madagascar drugs collected by Dr. G. W. PARKER, the Physician to the Queen of that island, and by the scarce and not easily obtainable Dyak poison of Borneo. The catalogue of the HANBURY Collection has been prepared for the press, and has now only to be enriched by additional notes from the private MSS. of the late Mr. DANIEL HANBURY before being published. The number of visitors to the Museum has shown a small increase, and many duplicate specimens have been distributed to local associations or lent for scientific purposes.

The Annual Meeting of the Pharmaceutical Society was held, as usual, on the third Wednesday in May, and was well attended. The address delivered on that occasion by the President, Mr. GREENISH, was not wanting in plain speaking. Referring to the "deep and general discontent" prevailing throughout the country with regard to the condition of the chemist and druggist, he attributed it, firstly, to the state of trade generally, and, secondly, to excessive competition. Much of this competition he said was due to young men of deficient education being lured into an over-crowded trade; instead of being educated pupils, articled to learn a trade, they were admitted from a low social scale, with deficient early education and small premiums, mainly for the sake of their manual labour, the desire to obtain this chiefly being greater than is consistent with a due regard to the advancement of pharmacy. Another cause mentioned was that some pharmacists lend their names and influence to the flooding of the trade and harrying of the medical profession with secret nostrums. If this "negation of true pharmacy" be followed to its logical issue, Mr. GREENISH thinks the result will be that "the medical profession will order medicines "by numbers and prescribe nostrums with obscure "names; prescriptions and pharmacists will disap-"pear together, and the ordinary huckster may keep "a supply—a 'line' of remedies—on his shelves, and "sell them to the public just as he now sells Bath "bricks and hearth-stones." In the Report presented the Council enumerated the different subjects which had engaged its attention during the year, many of which have already been referred to elsewhere in a previous summary and the remainder in the present one. The Financial Statement showed that, although there had been a slight decrease in the receipts in subscriptions and examination fees, the income had exceeded the expenditure by more than eleven hundred pounds. In the discussion that followed several speakers expressed their agreement with the spirit of the Presidential Address, and although some of the points touched upon in the Report elicited a brisk criticism, this did not prevent the meeting from adopting it unanimously.

The usual number of Evening Meetings have been held, and whilst these have been only moderately well supplied with papers the proceedings have always been sufficiently interesting to well repay those who attended them. The following are the titles of the papers read:—"Does Cod Liver Oil contain ·05 per cent. of Iodine?" by Mr. M. M. BIRD; "Iodine-yielding Algæ," by Mr. J. WHEELER; "Further Contributions to the Chemistry of the Rhizome of Zingiber Officinale," by Dr. J. C. THRESH; "Note on the Extract of Aconite and on the Alkaloid of Aconitum Paniculatum," by Messrs. E. L. CLEAVER and M. W. WILLIAMS; "The Orchard Alum Spring," by Dr. J. C. THRESH; "Note upon the Use of Oxalic Acid as a Test for Arseniates in Alkaline Salts," by Mr. C. PATROUILLARD; "Note on Tinctura Camphoræ Composita," by Mr. J. BLAND; "The Crystalline Constituent of Jafferabad Aloes," by Mr. W. A. SHENSTONE; "The Sale by Public Auction of Spurious and Worthless Drugs," by Mr. E. M. HOLMES; "Further Observations on Arsenic," by Messrs. W. A. H. NAYLOR and J. O. BRAITHWAITE. In addition to the foregoing, at the February meeting, Dr. PARKER, Physician to the Queen of Madagascar, exhibited a series of specimens of the Malagasy materia medica and furnished some interesting information concerning them.

At the Evening Meeting in October the Professors, as usual, made their reports as to the doings of the students in the previous session of the School of Pharmacy. *Il va sans dire* that these reports were favourable, and it is some proof of the good work done in the School that the PEREIRA Medal,—the Blue Ribbon of Pharmacy, which is open to all who have passed the Major examination during the year, wherever they may have studied,—was once more won by one of its students, who had also distinguished himself by carrying off the three silver medals of the School. After the distribution of the prizes an admirable address was delivered to the students by Mr. JOSEPH INCE.

The Annual Meeting of the North British Branch was held in May, in the Society's rooms in Edinburgh, under the presidency of Mr. J. B. STEPHENSON. The Report presented was a favourable one, the operations of the Branch having been carried out with a gratifying amount of success. Many

donations to the library and museum were acknowledged, and the attendance in the Society's rooms for the purpose of study was stated to be on the increase. Mention was made of the large proportion of failures—60 per cent.—in the Preliminary examination, among students who during the year had sat at the Scotch centres, as likely to draw attention to the elementary education of the younger members of the calling, and an opinion was also expressed that the curriculum scheme is fraught with issues of the greatest importance to the future of pharmacy in this country. The arrangement under which the duties formerly performed by the late Honorary Secretary, Mr. JOHN MACKAY, are now divided between an Honorary Treasurer, appointed by the Council in London, and the ordinary Secretary to the Branch, were reported to be working smoothly and satisfactorily. After the Annual Meeting the newly elected executive chose Mr. ALEXANDER NAPIER, President, and Mr. JOHN NESBIT, Vice-President, for the ensuing year.

The Chemists and Druggists' Trade Association of Great Britain held its Annual Meeting in London in May. The Report recounted a considerable amount of work done by the Association in the defence of some of its members, also in the prosecution of offenders under the seventeeth section of the Pharmacy Act, and in various other ways; but the balance sheet showed that notwithstanding this the receipts had been insufficient to meet the current expenses by about two hundred pounds. As no statistics are given as to membership, it is not quite clear whether this resulted from a falling off in the number of members or from the failure of members to pay their subscriptions promptly, which it was said by one of the speakers had reduced the income that should have been derived from this source by about 60 per cent. Suggestions were made as to the best means of increasing the number of members, and the more efficient collection of subscriptions. It is to be hoped that these measures may be successful, or else the Executive of the Association will become seriously cramped in the carrying out of the good work for which it is peculiarly fitted, if, indeed, the Association itself does not come within measurable distance of collapse. Last month the Association organized a meeting in London to give the chemists and druggists of the Metropolis an opportunity of conferring together on trade matters, but it cannot be said that the attendance was sufficiently numerous or the discussion of such a nature as to encourage the Executive to repeat the experiment.

The Annual Meeting in May and the presence of many members and friends of the Pharmaceutical Society in London at that time again afforded the occasion for a Conversazione in the South Kensington Museum and a Dinner at the Freemasons' Tavern. These festive meetings were as usual preceded by a "Chemists' Ball," in January. But last year the junior members of the calling also organized a Ball and a Dinner, with a success that warrants a repetition. Are these multiplied junketings, to say nothing of the "scientific outing" in connection with the British Pharmaceutical Conference, to be deemed signs of the times, and if so what may they be supposed to indicate in relation to the "deep and general discontent" spoken of by the late President? Certainly, according to the statistical abstract published in *Kemp's Mercantile Gazette*, only just over half as many chemists and druggists failed in business in 1882 as failed in 1881.

The proceedings of the Council of the Pharmaceutical Society of Ireland have been regularly reported in this Journal. This Society, like its sister Society in Great Britain, has had to regret a slight decrease in the number of its members, though unfortunately it is yet too young to be so well able to spare them. The attention of the Council has been devoted principally to the consideration of desirable amendments in the Pharmacy Act, Ireland,—especially with respect to the registration of "druggists," who are allowed to sell poisons but not to compound medicines,—and the nature and extent of the practical experience to be required from candidates for the examination. The Annual Meeting was held in October, when Professor TICHBORNE was unanimously re-elected President, Dr. AQUILLA SMITH, Vice-President, and Mr. HODGSON, Treasurer. Before the meeting broke up a committee was appointed to report on the best means of making the Society more attractive and of inducing licentiates to become members.

The British Pharmaceutical Conference met in Southampton at the end of August, under the presidency of Professor ATTFIELD, when a report was presented showing some falling off in the number of members, which, however, it was believed would prove to be only temporary. About the usual number of papers were read, most of which will be referred to elsewhere. But the feature of the meeting was undoubtedly an exceptionally able address delivered by the President, having for its subject the collection, preparation, and distribution of drugs. As usual, in the same week the British Association met in the same town, with Dr. C. W. SIEMENS as its President, whilst earlier in the same month the British Medical Association held its jubilee meeting in the city of Worcester. The German Pharmaceutical Association met in Berlin in the first days of September, under the guidance of its popular President, Dr. C. BRUNNENGRÄBER, and the meeting was attended by the President of the International Pharmacopœia Commission, Herr A. von WALDHEIM, who made a very satisfactory statement as to the progress of that work. Then, a few days later, the American Pharmaceutical Association held a successful meeting at Niagara Falls, its two Presi-

dents being Professor P. W. Bedford and Mr. C. Heinitsh. Lastly, almost simultaneously, the Austrian Pharmaceutical Association met at Agram.

A large number of prosecutions for offences under the Pharmacy Act have been instituted during the past year. Those for a breach of the fifteenth section by the illegal assumption of a protected title were, of course, carried out in the name of the Registrar, acting under the instructions of the Council of the Pharmaceutical Society. Most of the prosecutions under the seventeenth section, for the offence of insufficient labelling of poisons, were undertaken by the Executive of the Trade Association, and only a few of them were initiated by the police. It is very desirable, however, as pointed out by Mr. Greenish at the Annual Meeting, it should be more generally understood that the provisions of the Act of Parliament do not throw upon the Pharmaceutical—or any other—Society the onus of prosecutions under the seventeenth section, since these can be instituted by any member of the public, and might, with advantage, be undertaken more frequently by the Public Prosecutor or the police.

The cases of death by poisoning during the year do not call for any particular remark, except that as usual several have been due to narcotic preparations, and a number more than usual to one or other of the poisons which the Privy Council has recently declined to include within the Schedule.

There have been a few cases of excise proceedings worthy of being mentioned briefly. One of the most noticeable of these was a prosecution by the Inland Revenue authorities of a person carrying on the business of a "Drug and General Supply Association," on the charge of having sold laudanum, a preparation capable of being used internally as a medicine, in the making of which methylated spirit had been used. The defence offered was the remarkable one that the laudanum had been made with duty-paid proof spirit, to which wood spirit had been added to make it clear and to give it the particular flavour preferred by the people of the district. The magistrates considered the case doubtful, and gave the defendant the benefit of the doubt. In another Excise prosecution for the sale of paregoric made with methylated spirit the offence was attributed to a mistake, but a modified penalty was inflicted. Another important Excise prosecution was for the several offences of using a still, compounding spirits in the preparation of "essences," and the separation of gum resin from methylated "finish." A conviction was obtained, and the penalties imposed amounted altogether to £1275.

The history of the sciences upon which the practice of pharmacy is based bears also the character of a quiet year. Many new remedies have been proposed, old ones have received new applications, discoveries of new principles have crowned chemical research, and numerous suggestions have been published having a bearing upon practical pharmacy; but there has been no one subject of greatly predominating importance, and, probably, no very momentous addition has been made to the materials previously in use for combating disease. Perhaps the most interesting fact of the year has been the reduction to a certainty of what had before been only a suspicion, that the barks which under the name of "cuprea" have, during the last two or three years, attained such importance as a source of quinine, are not derived from plants belonging to the genus *Cinchona*. This was first announced in a paper published in this Journal in April, the fact having been determined by the celebrated quinologist, Dr. Triana, as the result of an examination of specimens of the plants yielding the barks received from Columbia, which proved to belong to two species of *Remijia*. There appear to be at least three different varieties of bark which have been imported under the name of "cuprea." But the best known of these, and probably the richest in quinine, is that which was first introduced as coming from Bucaramanga, in the north of Columbia; this is said to be derived from plants growing in the mountainous regions of La Paz, which have been referred by Dr. Triana to *Remijia Purdieana*. Two other varieties derived from plants growing in a district further south, beyond Bogota, in the Orinoco basin, have been referred to *R. pedunculata*. The importance of this determination depends upon the fact that a new series of plants, which are said to be more hardy and easily cultivated than cinchonas, have been rendered available as a source of the important febrifugal alkaloids which had been previously supposed to be confined to that genus. Some interesting observations by M. Arnaud show that all these cuprea barks have a greater density than any of the cinchona barks, varying from 1·128 to 1·320, whilst the greatest specific gravity noticed in a cinchona bark was 1·077. According to analyses made by M. Arnaud, the Orinoco cupreas do not as a rule equal Bucaramanga bark in the quantity of quinine they contain; but all these barks are remarkable for the proportion of quinidine present, and the absence of cinchonidine. Amongst the bark from Bucaramanga a very dense variety is sometimes met with, which is nevertheless considered by Dr. Triana to be the product of the same species growing under different conditions. It is noteworthy, however, that it is from this variety that M. Arnaud claims to have separated a peculiar alkaloid which he has described under the name of cinchonamine. It may be here mentioned that the alkaloid, which under the names of "homoquinine" and "ultraquinine" was described simultaneously by three sets of observers at the close of last year, has been

the subject of an investigation by Dr. HESSE, who has described its physical properties more minutely and attributed to it the formula, when dried at 120° C., of $C_{19}H_{22}N_2O_2$. The neutral sulphate is described as crystallizing with six molecules of water in short prisms. As homoquinine sulphate resembles quinine sulphate in its sparing solubility in water, Dr. HESSE thinks it is probably frequently present in the commercial salt; but "homoquinine" is markedly distinguished from quinine by its sparing solubility in ether. Herr KÖRNER has made the curious observation that during the manufacture of sulphate of quinine from cuprea bark a notable quantity of caffeic acid is formed, evidently as the product of the breaking up of a complex substance existing in the bark together with the alkaloid, and this is found in the mother-liquor in the state of caffeate of quinine. The genera *Cinchona* and *Coffea* both belong to the same natural order, although not to the same tribe, and this chemical confirmation of botanical relationship has its counterpart in a previous observation of quinic acid in the coffee plant.

One plant that promises to come into use is the well-known "lily of the valley," *Convallaria majalis*. It is said to exercise an action upon the heart similar to that of digitalis and also to be one of the most powerful diuretics known. From experiments made by M. LANGLEBERT it would appear that the best cardiac results are obtained with an aqueous extract prepared from the flowers and stalks with the addition of a third of their weight of the roots and leaves. The diuretic results appear to depend upon a resinous principle which is taken up in an alcoholic extract. Probably, however, the form in which this medicine will be most frequently administered will be by using "convallamarin," one of two glucosides present in the plant and which appears to be its active cardiac principle. Another plant yielding a glucosidal principle described as having an action similar to digitalin, but far more powerful, is the *Adonis vernalis*. The glucoside has been separated and described under the name of "adonidin" by Dr. CERVELLO, who claims for it that it has the advantage of not being cumulative.

The uncertain nature of preparations of aconite has been the subject of several papers. At the Evening Meeting in March, Messrs. CLEAVER and WILLIAMS called attention to an extract prepared from *Aconitum paniculatum* which failed to produce on the tongue the peculiar tingling sensation characteristic of the official extract, and contained a small amount of a very bitter alkaloidal substance, which they were disposed to think might be identical with the non-poisonous picraconitine observed on one occasion by Mr. GROVES. Mr. HOLMES afterwards referred to the non-production of the tingling sensation by varieties closely resembling the official aconite in a paper read before the Pharmaceutical Conference, and having expressed the opinion that the description of the official plant in the Pharmacopœia is insufficient, proposed to limit the official drug to home-grown aconite flowering in May and June and gathered when the plant is in flower. Dr. SQUIBB also looks upon the tingling indication as valuable and has suggested a rough standard for the strength of aconite preparations, based upon the time which elapses before it is produced by aqueous dilutions of them. The varying potency of different alkaloidal substances supplied under the name "aconitine" has also been illustrated by physiological experiments in connection with a legal inquiry in Holland, in which one preparation was estimated to be one hundred and seventy times more powerful than another. Some experiments made by Dr. SQUIBB also point in the same direction, and to this consideration no doubt is to be attributed the omission of aconitine from the new editions of the German and United States Pharmacopœias.

Mr. GERRARD has contributed further information as to the alkaloidal value of belladonna plants at different periods of their growth. His experiments with wild plants seemed to indicate that the development of alkaloid is favoured by a chalky soil, but that very little is formed in the first year. Those with the cultivated plant appeared to show that the greatest development of alkaloid takes place simultaneously in the root and the leaf at the flowering period and is maintained during the fruiting. The substitution of the root of *Medicago sativa* for belladonna root has been observed by Mr. HOLMES.

Under the name of "tambor," specimens of a tree growing in Central America were received by the late Mr. HANBURY with the information that its fruit yields by pressure a large quantity of a very fine oil, resembling castor-oil in its purgative effect, but rather pleasant to the taste, and with the advantage that it does not gripe. The herbarium specimens have now been described by Mr. HEMSLEY as belonging to a new species, to which he has given the name *Omphalea oleifera*. Another plant which has been identified as the source of a fragrant volatile oil, said to come from Jamaica under the name of "tobacco-bush oil," and may eventually be utilized, is the *Hedyosmum nutans*. The plant itself is popularly known as the "headache weed," and is said to be generally used by the natives for making tea and binding round their heads when in pain, whilst a preparation of the leaves and flowers is said to be used as a stomachic and spasmodic. An interesting description of the manufacture on a large scale of an essential oil from an American species of birch, the *Betula lenta*, has been given by Mr. G. W. KENNEDY. The whole plant is used for distillation, and the oil is sold as "oil of winter-

green," which it closely resembles. The production of peppermint oil on the large scale in New York State has been also described. It is said that this oil, as exported from Wayne county, is colourless and resembles the English oil, except that its odour and taste are somewhat less pungent and penetrating. With respect to the source of Chinese and Japanese peppermint oil, Mr. HOLMES, having made a curious observation that typical specimens of *Mentha arvensis*, var. *Javanica*, from which plant it has been said to be derived, had not the taste of peppermint, but a flavour similar to that of *M. viridis*, took the trouble to obtain from China and Japan specimens of the peppermint plants of those countries. Both plants were found to possess most of the characters of *M. arvensis*, but the Chinese plant was found to more closely resemble and indeed to be identical with *M. canadensis*, var. *glabrata*, specimens of which, obtained from different localities in the United States, were found to possess the flavour of peppermint in a feeble degree. As the chief point in which the Japanese plant differs from *M. arvensis* is in its flavour, Mr. HOLMES proposes to name it *Mentha arvensis*, var. *piperascens*. Mr. HOLMES raises the question whether these variations in the essential oil are dependent on development, climate, soil or sex, and whether the oil in each case is a mixture in which one ingredient is present in variable proportions in different plants. The increasing demand for a preparation known as "bay rum," which is made by the distillation of the leaves and berries of the bayberry tree (*Myrcia acris*) with rum, has directed some attention to other members of the Myrtaceæ yielding aromatic volatile oils, and an exhaustive enumeration of them has been supplied by Professor MAISCH. The botanical source of another essential oil, oil of cassia, would appear now to be satisfactorily cleared up. Herbarium specimens in flower, derived from the districts in China in which the cassia tree is cultivated, show that the plant is the *Cinnamomum Cassia*, and, as far as can be ascertained, "cassia lignea," cassia buds, and the leaves from which oil of cassia is distilled, are obtained from this tree only. It may be mentioned here that, according to a report presented by Mr. A. H. JACKSON to the Conference, although the oils of cinnamon and cassia may be distinguished from each other by their odour and taste, they have no other very characteristic physical property in which they differ, and a chemical examination indicated that any constituents in which they might differ from each other are present only in extremely small proportion.

One of those thorough investigations of crude drugs with which the name of Dr. HESSE is associated, has been carried out by him in respect to the barks and wood coming from the Argentine Republic under the name of Quebracho. From the bark derived from one of the Apocynaceæ, *Aspidosperma Quebracho*, besides the alkaloid aspidospermine, separated by FRAUDE, he obtained five other alkaloids, which he named aspidospermatine, aspidosamine, hypoquebrachine, quebrachine and quebrachamine, as well as a neutral substance which he called quebrachol. In the Quebracho wood from *Loxopterygium Lorentzii*, a terebinthaceous plant, which has been used in medicine, he could find no alkaloid at all, but in the bark of this wood he found indications of two alkaloids, one of which he named loxopterygine. The *Aspidosperma* alkaloids appear to have a physiological action similar to that of the *Strychnos* bases, but less powerful. Messrs. HECKEL and SCHLAGDENHAUFFEN have made a thorough investigation of "m'boundu," the Gaboon ordeal poison, which has been said to contain two special alkaloids, but they have come to the conclusion that strychnine, which is present in the root bark, stem bark and leaves, is its sole alkaloid and active principle. Another crude product, said to have an action similar to curare, and called "guachamacha," has been introduced from South America; it consists of an aqueous extract derived from one of the oleanders. Box-tree bark has been alleged to contain alkaloidal substances which are capable of being used as substitutes for quinine. The subject has been thoroughly investigated chemically by Mr. ALESSANDRI, who found that the *Buxus sempervirens* contains three special and distinct alkaloids, namely, buxine in the bark, buxeine in the leaves, and parabuxine in both the bark and the leaves. Buxine has been stated to be identical with berberine and also with pareirine and paricine; this point, however, and the physiological action remain yet unsettled. It may be mentioned here that Mr. ALESSANDRI used oxalic acid as a means of separating these alkaloids, and he has also applied the method to the separation of the cinchona and other bases.

A great deal of other interesting work was done last year in connection with the alkaloids. Revising the statements of previous experimenters, Mr. DOTT came to the conclusion that Dr. HESSE was mistaken in supposing that the methyl-morphine obtained by M. GRIMAUX in acting with methyl-iodide on morphine dissolved in alcoholic solution of soda was isomeric, but not identical with codeine. This was practically admitted by Dr. HESSE in a subsequent communication, he having apparently been misled by the formation at the same time of a di-methyl compound. Mr. DOTT has also done some very valuable work towards clearing up the confusion which existed respecting the solubility of salts of morphine, and in respect to this alkaloid he has further illustrated the untrustworthiness of many of the so-called colour reactions. Herr FISCHER, starting with xanthine has succeeded in introducing two methyl groups into it to produce theobromine, and this by the introduction of another methyl group has been converted into

caffeine. M. TANRET has provided a convenient method of obtaining caffeine in solution by forming very soluble double salts with benzoate, cinnamate or salicylate of soda. Atropine has yielded two new bases by treatment with nitric acid, one by the loss of the elements of water, called "apoatropine," which is crystalline and forms crystalline salts, but does not cause dilation of the pupil; the other, called "nitroatropine," not forming crystalline salts, but dilating the pupil of the eye. Herr LADENBURG has made further progress towards the synthesis of atropine, starting from pyridine, whilst on the other hand the products obtained in the decomposition of atropine, of brucine, and other alkaloids, have given some confirmation to the suggestion of Dr. KÖNIGS that the pyridic nucleus should be considered analogous to the benzoic nucleus, and that under the name "alkaloid" should be understood organic vegetable bases which are pyridic derivatives. Erythrophleine, the alkaloid of sassy bark, has been found by Messrs. GALLOIS and HARDY to break up in a manner analogous to atropine into an acid and another base. Some further experiments by Mr. SHENSTONE on the nux vomica alkaloids appear to show that brucine is strychnine in which two atoms of hydrogen are replaced by two methoxyl groups. Dr. HOFFMAN has shown that the formula for coniine wanted amending by the addition of two atoms of hydrogen, and that it is correctly represented as $C_8H_{17}N$; consequently conydrine is not a hydrate of it as supposed.

Besides the investigation in respect to homoquinine, before referred to, Dr. HESSE has given further information respecting some of the more uncommon cinchona alkaloids, and has described a new one, which is liquid, volatile and odorous, and which he thinks may possibly play some part in the formation of quinine; this he has named "cincholine." Dr. DE VRIJ has defended from attack his process for the quantitative estimation of quinine by means of iodosulphate of quinoidine, and has brought forward strong evidence to show that the herapathite formed under the conditions laid down is very constant in composition. He has also described a modification of PROLLIUS's process for the estimation of the total alkaloids of cinchona bark, in which a mixture of ether, spirit and ammonia is used to extract the bark. In a paper read by Mr. GILES before the British Pharmaceutical Conference, another process for the estimation of the total alkaloids, recommended by Dr. DE VRIJ, was described, in which the bark is exhausted with dilute hydrochloric acid. In the same paper Mr. GILES put forward a plea for a return to the use of pharmaceutical preparations of the bark. Quinine iodate and bromate have been recommended for therapeutic use by Dr. CAMERON, and some attention has been paid to the preparation of a "tasteless" tannate. Among the substitutes for quinine, chinoline continues to hold a place, as well as its tartrate and salicylate; but early in the year Mr. EKIN gave some reasons that the substance supplied at that time as "pure chinoline" was more or less a mixture of homologous bodies. Being sceptical as to chinoline representing all the characteristic properties of quinine, Messrs. FISCHER and KÖNIGS prepared for physiological experiment a number of compounds by the introduction of various hydroxyl and other groups into the chinoline molecule. It was found that the antipyretic property is possessed to the greatest degree by compounds in which the nitrogen atom is joined with two atoms of carbon in the chinoline ring and an atom of carbon in a methyl or other alcohol group. This occurs in three known compounds, but the most convenient for preparation is oxychinolinmethylhydride, which has been named more briefly "kairine."

Several new vegetable principles, besides those already mentioned, have been isolated during the year. Among the alkaloids are "oxyacanthine," which accompanies berberine in the root of the *Berberis aquifolium*; "sapotine," separated from the astringent and febrifuge bark of the West Indian sapotilla tree (*Sapota Achras*); "macleyine," from a Japanese papaveraceous plant (*Macleya cordata*); "nupharine," from the rhizome of the yellow water lily (*Nuphar luteum*); and an unnamed alkaloid from the bark of the white ash (*Fraxinus Americana*). A new poisonous glucoside has been observed in the *Thevetia nereifolia*; a poisonous neutral principle has been isolated from the Japanese ericaceous plant, *Andromeda japonica*, and named "asebotoxin," and quassiin has been found to be present in very variable quantities in the wood of both *Quassia amara* and *Picræna excelsa*. Salicylic acid has been found to be present in all parts of *Viola syrtica* and *V. tricolor*. Dr. WORMLEY has negatived the assertion that gelsemic acid is identical with æsculin. Mr. SHENSTONE has examined Jafferabad aloes and obtained an aloin from it apparently identical with the aloin from Zanzibar aloes, and Dr. LENZ has shown that what is known as BORNTRÄGER'S test for aloes is untrustworthy, as the reaction is common to bodies containing chrysophanic acid. Herr SINGER has found that lignin is a complex body, of which vanillin is an invariable constituent, and that probably this principle is present in minute quantity in all woody tissue. Lastly, the chemistry of bast fibres has been studied by Messrs. CROSS and BEVAN, who have not only rendered a service to science by explaining some of the causes of the tendency of jute goods to spoil, but have worked out the history of a number of new compounds formed by the action of chemical reagents upon vegetable fibre.

Synthetical chemistry has also made some progress during the year, perhaps the most interesting

step being the very recent synthesis of uric acid from urea and glycocoll by Dr. Horbaczewski. Thymol has been built up partially, starting with cuminol, the principal constituent of the essential oil of cumin. Lactic acid has been prepared artificially by heating dextrose with a caustic alkali, neutralizing with sulphuric acid and removing the sulphate by means of alcohol. Succinic acid has been produced by the fermentation of tartaric acid set up by a few drops of a fermenting solution of ammonium tartrate. Bromochloral, chlorobromal, and their hydrates and alcoholates, and bromochloroform and chlorobromoform, are the names of a number of allied compounds that have been produced by the action of bromine and chlorine upon alcohol. Here also may be mentioned an able paper on terpene hydrate read by Mr. R. H. Parker before the Pharmaceutical Conference.

Turning to another class of chemical subjects, reference must be made to the masterly papers of Messrs. Naylor and Braithwaite, which have disposed of a misstatement in chemical manuals and shown that neither oxalic acid nor oxalates exercise a reducing action upon arsenic acid or arsenates. Professor Tichborne has suggested a new method of making soap solution for testing the hardness of water, and also a new form of apparatus for preventing contamination from atmospheric impurities during the estimation of ammonia in water. The colour reaction between gallic acid and nitrous acid has been utilized by Dr. Davy in the determination of nitrites in water. A method of preparing bismuth subnitrate free from arsenic has been recommended by Mr. Schneider, based upon the insolubility of bismuth arsenate in a concentrated neutral solution of bismuth nitrate. Mr. Fletcher has observed a new very basic iodide of bismuth, simulating iodide of lead, and four salicylates of mercury have been described by Mr. Lajoux.

Recently the hypophosphites have come much into use, and Mr. Gibson has done useful service in working out and publishing a process for the preparation of the compound solution, which, although it has been subject to criticism, will probably yield a product sufficiently satisfactory to most prescribers. A useful formula for a soluble saccharate of iron has also been worked out by Dr. Brunnengräber. Other pharmacists have furnished formulæ for ferrated albumen, albuminated ferrous borotartrate, and mercurial peptones. Ammoniated preparations of ergot have recently assumed some prominence, and a formula has been furnished by Mr. Gerrard. It has been suggested that the definite salts should be used in making preparations of the oleates, but Dr. Squibb has given reasons for preferring a solution of the oleate in oleic acid, based on the facility with which oleic acid is absorbed by the skin. Cotton seed oil has been recommended for pharmaceutical use in the preparation of lead plaster and different liniments. Chlorinated oil is a preparation that has been reported to be coming into use in the United States for chronic affections of the skin. The use of the heavier paraffins derived from petroleum has now received official sanction by the admission of a "petrolatum" into the United States Pharmacopœia; a considerable amount of information has been published respecting the melting points of these semi-solid hydrocarbons, and in the above work two melting points, 104° F. and 125° F. have been adopted. Mr. T. E. Greenish has pointed out that if petroleum spirit be used to remove fat from nux vomica, it will carry with it also a considerable portion of the alkaloids, but that percolation with coal-tar benzol does not remove any. The influence of gum arabic in retarding certain chemical reactions has been described by M. Lefort, and is evidently a property that can be utilized in the pharmacy. Gregory's powder has been the subject of further discussion in Scotland. Mr. Macpherson has arrived at the conclusion that the chief cause of immiscibility is added fatty matter, and Mr. Nesbit, who has examined samples of rhubarb for fixed oil, is of opinion that the practice of adding oil prevails to a considerable extent. Dr. Clark, too, has found as much as 7 per cent. in one sample, and is of opinion that the presence of oil is the chief cause of the non-miscibility of Gregory's powder, but that even when it occurs in the powder exposure to moisture or the original presence of moisture is a necessity to the production of this condition. Apart from these interesting observations it may be mentioned that it has been pointed out that the immiscibility of Gregory's powder may be easily overcome by shaking it briskly with water in a bottle. Another pharmaceutical subject that has been brought before the North British Branch is the confection of sulphur, and Mr. Peter Boa has shown that the separation which takes place may be obviated by the addition of two grains of gum tragacanth in powder to the ounce. Mr. Mackenzie also has suggested the use of a petrolatum in the preparation of cold cream, and his opinion has been confirmed by the experience of Mr. W. H. Symons. Mr. Bland has recorded the observation that he has obtained better results in preparing tinct. camphoræ co. with the oil of *Pimpenella anisatum* than with the oil of star-anise. Lastly, Mr. A. C. Abraham has pointed out the extent to which the preparation of lime water may be affected by temperature.

A great deal of interesting work has been done in investigations of the physiological effects of different ferments and micro-organisms, but although these may exercise much influence on the future of pharmacy they can only be mentioned here with the utmost brevity. The discovery by Dr. Koch of the bacillus supposed to be the cause of phthisis, and the means of detecting it in the sputa; the

researches as to the minute organism alleged to be the cause of paludal disease; the recent discovery by M. Pasteur of the microbes which are supposed to produce rabies in dogs and pneumo-enteritis in pigs, are all full of promise in respect to the future treatment of disease. Many interesting contributions have also been made to the history of pepsine, diastase and similar ferments, and what has been observed as to the part which bacteria and similar organisms may play in the formation of peptones reveals a wide field of research. Nor is the subject wanting in technical interest, as is shown by the researches on the work done by ferments in the formation of nitrates or in their reduction to nitrites and in the communication of special properties to cheese.

The field of physics is a wide one and workers have been busy therein, but the predominant interest during the year has been devoted to subjects connected with the development, storage and application of electric energy. The magnificent exhibition of electrical apparatus at the Crystal Palace in the spring furnished the pretext for a series of articles in this Journal, in which the chief underlying principles were described with sufficient fulness to render further notice here unnecessary. Other subjects connected with physics have been referred to in "The Month," as they arose. Excuse may, however, perhaps be found for special mention of the interesting address on atoms and molecules, which Mr. B. S. Proctor recently delivered before the Newcastle-on-Tyne Chemical Society, on the ground that it was the effort of a well-known practical pharmacist.

The year that has seen the publication of two such important works as the new editions of the Pharmacopœias of Germany and the United States cannot be said to be poor in the production of books interesting to pharmacists. Besides this there have been Dr. Whitla's little work on the 'Elements of Pharmacy, Materia Medica and Therapeutics,' numberless manuals of chemistry, good, bad and indifferent, and a new edition of Bentley's 'Manual of Botany.' Mr. Allen has supplied another volume of his important work on 'Commercial Analysis,' and Dr. Phillips another of his 'Materia Medica.' Then, too, Dr. Quain's 'Dictionary of Medicine' is a book that will find its way to the bookshelves of some of our readers. Cinchona culture, also, is accumulating a literature of its own, and within the last few days we have received an English translation of a handbook on the subject, written by Mr. van Gorkom. Finally another 'Year-Book' is even now making its way into circulation.

The death roll of the year contains some names that lovers of science in succeeding generations will long hold in reverence. Greatest among them all stands that of our own countryman, Charles Darwin, who has left such a mighty impress upon the study of natural history. Another name is that of Antoine Bussy, whose researches upon sulphurous and sulphuric acids must remain a part of their history, and who for many years conducted the most important pharmaceutical journal in France. Germany contributes the name of Friedrich Wöhler, who by his synthesis of urea obliterated the distinction that had been set up between organic and inorganic compounds. America has lost the two Drapers, father and son, but not before each had won a niche in the Temple of Fame. Turning to men who have been more particularly lost to British pharmacy, place must be given to Daniel Bell Hanbury, honoured for his own services as well as for the sake of those of his son. Sir Robert Christison, also, is a name of which Scotchmen are justifiably proud, bringing to memory good and sympathetic work done in the early days of the Pharmaceutical Society, of which he was an Honorary Member. The North British Branch has also lost in George Blanshard one of its former Presidents. In the North, too, at Leeds, Titus Bennett Stead passed away whilst still holding office as President of the local association. In London the Board of Examiners has lost the genial presence of Alfred Allchin. Then among other names that will occur to memory are George Henry Thwaites, the botanist, A. Freire-Marreco, of Newcastle, Samuel Urwick Jones, of Leamington, and Robert Howden.

Once more our yearly task is at an end. The subjects enumerated in our review will suffice to show that if pharmacy in Great Britain did not make any demonstrative progress last year it was not asleep. On the threshold of another year, which promises to raise issues of unusual importance to the pharmaceutical community, we venture so offer our wishes that they may be decided in accordance with its prosperity.

THE PROPERTY IN PRESCRIPTIONS.

In the *Lancet* last week a case is put by a patient who received a prescription from his doctor, with an intimation that it could only be made up at a certain establishment. Some time afterwards, considering himself to be in need of the same medicine, he took the prescription to the same chemist, who, however, refused to make it up on the ground that he had been told by the doctor not to dispense it without his sanction, and this statement was confirmed on communicating with the medical man. The patient contends that the prescription is his property and that he is free to have it made up every day if he chooses, and asks the opinion of the Editor of the *Lancet* on the point. The answer given, which at any rate cannot be said to be wanting in "lucidity," is as follows:—"A medical "man is at liberty to make his own terms as to "attendance, but the system described in our cor- "respondent's letter is not generally practised or "approved. A medical man either dispenses or "prescribes. If he prescribes, the prescription "ought to be the property of the patient, to be "used when and how he pleases, and ought to be "written so that it may be compounded by any "legally qualified chemist."

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL.

Wednesday, January 3, 1883.

MR. MICHAEL CARTEIGHE, PRESIDENT.

MR. SAMUEL RALPH ATKINS, VICE-PRESIDENT.

Present—Messrs. Andrews, Bottle, Butt, Churchill, Gostling, Greenish, Hampson, W. Hills, Radley, Richardson, Robbins, Savage, Schacht, P. W. Squire, Symes, Williams and Woolley.

Publication of the List of Subscribers to the Benevolent Fund.

The minutes of the previous meeting were read and confirmed, as also the minutes of the meeting of Subscribers to the Benevolent Fund for the election of annuitants.

Mr. Symes drew attention to what he considered to be an omission from the minutes, as published in the Journal, viz., that after reading the Benevolent Fund minutes it was announced that the resolution of the Council passed in October or November was to some extent set aside. He then suggested that, as the date of publishing the list of subscribers to the Benevolent Fund had been postponed for the convenience of the office, some notice should be taken of it, in order that those who had seen the former resolution and were expecting the list might understand why it did not appear at the time named. He did not find any notice of the matter in the Journal, which appeared to him a little discourteous to the subscribers.

Mr. Richardson said another matter of regret in connection with this subject was that no notice had been given to the publishers, Messrs. Churchill, that such publication was about to be carried out; and he feared some loss might accrue in consequence, as an extra number of advertisements might be expected for such special number, had due notice been given.

The President remarked that until the recommendations of the Committee were approved by the Council no formal notice of the matter could be given to the publishers. As soon as the Council had sanctioned the issue notice was given. With regard to Mr. Symes's remarks, the fact of the postponement was stated in the Journal in the report of the Library, Museum, Laboratory and House Committee to the Council last month.

Mr. Symes, having referred to the report, said he found the matter was mentioned there, but he had overlooked it, having expected to find it after the report of the Benevolent Fund Committee.

The Board of Examiners.

The Secretary read a letter which had been received from the Privy Council, approving the appointment of Examiners as reported last month.

Diplomas.

The following, being duly registered as Pharmaceutical Chemists, were respectively granted a diploma stamped with the seal of the Society:—

Burton, Walter.
Fowler, George.
Marshall, Joseph Jewison.
Nichol, Anthony.
Richards, Thomas.
Williams, William Jesse.

Elections.

MEMBERS.

Pharmaceutical Chemists.

The following, having passed the Major examination and tendered their subscriptions for the current year, were elected "Members" of the Society:—

Jones, John .....London.
Knight, William Tomkinson ...Peterborough.
Thornley, Frederick .....London.
Williams, William Jesse .....Gloucester.

Chemists and Druggists.

The following registered chemists and druggists, who were in business on their own account before August 1, 1868, having tendered their subscriptions for the current year, were elected "Members" of the Society:—

Gilbert, Charles Edwin .....Dawley.
Kearnes, Robert Henry .....Bilston.

ASSOCIATES IN BUSINESS.

The following, having passed their respective examinations, being in business on their own account, and having tendered their subscriptions for the current year, were elected "Associates in Business" of the Society:—

Minor.

Buckley, James Julian .....London.
Lawrence, Samuel .....Oban.
Llewellyn, Lewis Herbert .....Bridgwater.
Milner, Thomas .....Consett.
Willet, John Algernon .....Port Elizabeth.

Modified.

Evans, Charles Edward .....Moretonhampstead.
Gooseman, William .....Grimsby.
Pooley, John Dingley S.....Wimbledon.

ASSOCIATES.

The following, having passed the Minor examination and tendered their subscriptions for the current year, were elected "Associates" of the Society:—

Cardwell, Augustus .....Derby.
Chater, Arthur Brand .....Elmdon.
Collins, Herbert Sleight .....Bradford.
Deacon, Frederick George .....Frome.
East, William Alfred .....Princes Risbro.
Fleming, Ebenezer .....Castle Douglas.
Jenkin, William John..... .....Plymouth.
Lambert, John Thomas .....Hoyland.
Langley, Frank Collins .....Ashford.
Luxmoore, Charles Mann .....Bristol.
Miller, William Philip F. .....Folkestone.
Pask, Thomas Edward .....Newark.
Perkins, Charles Lynham ..... Plymouth.
Pridmore, Sydney Spencer .....Hinckley.
Ridgley, Cromwell .....Huntingdon.
Sharpe, William Cecil.....Madeley.
Whiffin, Henry.....Market Harboro.

APPRENTICES OR STUDENTS.

The following, having passed the Preliminary examination and tendered their subscriptions for the current year, were elected "Apprentices or Students" of the Society:—

Baxter, William .....Bromley.
Bennet, Andrew Russell.....Uphall.
Black, Hugh Milner .....London.
Borthwick, Robert Waddell .. Bathgate.
Brett, William George .....Grantham.
Burnby, John James .....Bardney.
Clark, Alfred Turner Sims.....London.
Cock, John Frederick .. ..Southsea.
Corder, Edward ....Norwich.
Crockett, Henry .....East Grinstead.
Dodd, Richard Jefferson.....Sunderland.
Dymond, Thomas Southall.....Bristol.
Elliott, Stephen James .....Preston.
Foster, William .....Dewsbury.
Granger, Harold .....Nottingham.
Hendry, Robert Love .....Edinburgh.
Herbert, Sydney Reeves.....Cockermouth.
Hersant, Milton .....London.
Hine, Alfred Ernest.....Beaminster.
Howell, Alfred.....St. Clears.

Jackson, Herbert .....Horncastle.
Lees, James .....Manchester.
Lewis, Alfred Wheatcroft .....Swansea.
Lomax, William Henry .....Over Darwen.
McDonald, James .....Lochee.
McEwan, Donald.....Dunfermline.
Mack, George Henry .....Holt.
Marsh, Charles David.....Devizes.
Marsh, William Henry .....Old Catton.
Mason, John Henry.....Wirksworth.
Mathias, James Russell Hy. ...Tenby.
Midgley, Walter .....Keighley.
Morris, David Henry M.....Sunbury.
Munkman, Robert Allen.....Boston.
Pickering, Charles Edward.....Stockton-on-Tees.
Pidgeon, Alfred .....London.
Porter, Caleb Thomas George...London.
Pottage, John Wm. Dick .....Edinburgh.
Rees, David .....Newcastle Emlyn.
Roberts, James Frederick .....London.
Rudd, Henry Bulmer .....Bradford.
Sowden, Joseph .....Bowling.
Sugden, William Allen .....Waterfoot.
Thompson, Abraham Lewis ...Birmingham.
Tilley, Joseph .....Chelmsford.
Wilkes, Thomas .....Shrewsbury.
Wilson, Richard .....Kidderminster.
Wright, William Charles .....Stockport.
Zusman, Harry.....Wolverhampton.

Several persons were restored to their former status in the Society upon payment of the current year's subscription and a fine.

The names of the following persons, who had made the required declarations and paid a fine of one guinea, were restored to the Register of Chemists and Druggists:—

Andrew Duncanson, 4, East Thomas Street, Edinburgh.

John Wilkins Hodgson, 28, Mariner Street, Swansea.

Reports of Committees.

Law and Parliamentary.

Draft Pharmacy Bill.

The Council went into committee to receive the report of this Committee and to discuss in detail a draft Pharmacy Bill which it had prepared. The discussion having lasted several hours,

The Council resumed, when the following resolution was adopted:—

"That the report of the Law and Parliamentary Committee of November 22, December 18 and December 28, be received and that the draft Pharmacy Bill be again referred to the Committee with power to confer with the Privy Council thereon."

Mr. Schacht said he must now ask that his name might be withdrawn from the Committee, as he should not be able to take any further part in its proceedings.

The President suggested that Mr. Schacht should defer this matter for another month.

Mr. Schacht said he could not allow the matter to be postponed. It was no spasmodic action on his part. He had resolved some time ago that if there were a definite expression of opinion on the part of the Council in favour of two particular clauses in the draft Bill, he could not continue to act on the Committee.

Finance.

The report of this Committee was received and adopted, and sundry accounts were ordered to be paid.

Benevolent Fund.

The report of this Committee included a recommendation of the following grants:—

£10 to a former member, suffering from chronic disease, who has had eight previous grants of like amount.

£10 to the widow of a pharmaceutical chemist, who has had a previous grant.

£10 to the widow of a chemist and druggist and former member, and subscriber to the Fund.

£15 to the widow of a chemist and druggist, having six children dependent on her, who has had one previous grant.

£5 to the widow of a registered chemist and druggist, who has had three previous grants.

£10 to the widow of a registered chemist and druggist, who has had two previous grants of like amount.

£10 to the widow, aged 75, of a registered chemist and druggist.

One application which had been deferred twice for further information had been now definitely refused.

The gentleman who has charge of two of the Isherwood orphans (boys) had had an interview with the Committee, and had been requested to make some suggestion at an early date with regard to some employment for the elder boy, now in his fourteenth year.

The report and recommendations of the Committee were unanimously adopted.

Librarian's Report.

The report of the Librarian had been received, and included the following particulars:—

		Attendance.	Total.	Highest.	Lowest.	Average
November.	Day	627	33	19	24
	Evening	243	19	6	11

Circulation of books.	No. of Entries. Town.	Country.	Total.
	196	146	342

Carriage paid, £1 15*s.* 11½*d.*

The following donations to the Library had been received, and the Committee recommended that the usual letter of thanks be sent to the respective donors:—

Allgemeiner österreichischer Apotheker-Verein, Zeitschrift, 1882. From the Verein.
Alumni Association of the Philadelphia College of Pharmacy, Eighteenth annual report, 1882. From the Association.
American Journal of Pharmacy, 1882. From the Philadelphia College of Pharmacy.
American Pharmaceutical Association, Proceedings, vol. 29. From the Association.
Analyst, 1882. From the Editors.
Annuaire des Spécialités médicales et pharmaceutiques, 1882. From the Publishers.
Archiv for Pharmaci og technisk Chemi, 1882. From the Publishers.
Botanical Society [of Edinburgh], Transactions, vol. 14, part 2. From the Society.
Canadian Pharmaceutical Journal, 1882. From the Ontario College of Pharmacy.
Chemical News, 1882. From the Editor.
Chemical Society of London, Journal, 1882. From the Society.
Chemist and Druggist, 1882.
Chemists' and Druggists' Diary, 1883. From the Proprietors.
Chemists and Druggists' Trade Association, Sixth annual report, 1882. From the Association.
Chemists' Journal, 1882. From the Editor.
College of Preceptors, Educational Times, 1882. From the College.
Ephemeris of Materia Medica, Pharmacy, Therapeutics, etc., 1882. From Dr. Squibb.
Guy's Hospital, Reports, vol. 25, 1881. From the Hospital.
Imperatorskie S.-Peterburgskie Botanetsheskie. Sad, Acta horti petropolitani, tom. 7, fasc. 2. From the Sad.
Institute of Actuaries, Journal, and Assurance Magazine, 1882. From the Institute.
Institute of Chemistry, Register of Fellows and Associates, 1882. From the Institute.

Iowa State Pharmaceutical Association, Proceedings, 1881. From the ASSOCIATION.
Kaiserliche Akademie der Wissenschaften in Wien, Anzeiger, mathematisch - naturwissenschaftliche Classe, 1882. From the AKADEMIE.
Linnean Society of London, Journal, 1882.
— List, 1882. From the SOCIETY.
Liversidge (A.), Minerals of New South Wales, 2nd ed. From the AUTHOR, through the Royal Society of New South Wales.
Mason Science College, Calendar, 1882. From the COLLEGE.
Massachusetts Pharmaceutical Association, Proceedings, 1882. From the ASSOCIATION.
Medical News, 1881–2. From the PUBLISHER.
New Remedies, 1882. From the EDITORS.
Newcastle-upon-Tyne Chemical Society, Transactions, vol. 5, nos. 6–11. From the SOCIETY.
New South Wales, Department of Mines, Annual reports for 1880–81. From the DEPARTMENT, through the Royal Society of New South Wales.
Nieuw Tijdschrift voor de Pharmacie in Nederland, 1881. From Dr. J. MOREL.
Ny pharmaceutisk Tidende, 1882. From the PUBLISHERS.
Owens College, Manchester, Calendar, 1882. From the COLLEGE.
Pharmaceutical Society of Ireland, Calendar, 1882. From the SOCIETY.
Pharmaceutical Society of Victoria, Australasian supplement to the Chemist and Druggist, 1882. From the SOCIETY.
Philosophical Society of Glasgow, Proceedings, vol. 13, part 2. From the SOCIETY.
Photographic Society of Great Britain, Journal and transactions, 1882. From the SOCIETY.
Radcliffe Library, Catalogue of books added during 1881. From the LIBRARY.
Royal College of Physicians of London, List of fellows, etc., 1882. From the COLLEGE.
Royal College of Surgeons of England, Calendar, 1882. From the COLLEGE.
Royal College of Veterinary Surgeons, Register, 1882. From the COLLEGE.
Royal Dublin Society, Scientific proceedings, vol. 2, part 7; vol. 3, parts 1–4.
— Scientific transactions, vol. 1, parts 13–14. From the SOCIETY.
Royal Institution of Great Britain, Notices of the Proceedings, no. 74.
— List of Members, Report, etc., 1882.
— Catalogue of the Library, 1882, vol. 2. From the INSTITUTION.
Royal Medical and Chirurgical Society of London, Medico-chirurgical transactions, vol. 65.
— Proceedings. nos. 54–5. From the SOCIETY.
Royal Society of Edinburgh, Proceedings, nos. 108–9. From the SOCIETY.
Royal Society of London, Proceedings, nos. 216–21. From the SOCIETY.
Royal Society of New South Wales, Journal and proceedings, vol. 15.
Richards (T.), New South Wales in 1881.
From the ROYAL SOCIETY OF NEW SOUTH WALES.
St. Bartholomew's Hospital, Reports, vol. 17.
— Statistical Tables, 1881–82. From the HOSPITAL.
St. Thomas's Hospital. Reports, new series, vol. 11.
— Medical School Calendar and Prospectus for 1882–3. From the HOSPITAL.
School of Pharmacy Students' Association, Papers, 1880–81, vol. 7, MS. From the ASSOCIATION.
Smithsonian Institution, Annual report for 1880. From the INSTITUTION.
Société botanique de France, Bulletin, 1882. From the SOCIÉTÉ.
Société des Pharmaciens de l'Eure, Bulletin, 1881. From the SOCIÉTÉ.
University College, London, Calendar, 1882. From the COLLEGE.
University of Durham, Calendar, 1882. From the UNIVERSITY.
University of Edinburgh, Calendar, 1882. From the UNIVERSITY.
University of Glasgow, Calendar, 1882. From the UNIVERSITY.
University of London, Calendar, 1882. From H. M. GOVERNMENT.
Victoria, Pharmaceutical Register for 1881. From the PHARMACY BOARD OF VICTORIA.
Victoria University, Manchester, Calendar, 1882. From the OWENS COLLEGE.
Yorkshire College, Calendar, 1882. From the COLLEGE.
Herlant (A.), Caractères microscopiques de quelques Graines officinales, 1882. From the AUTHOR.
Malosse (T.), Propriétés optiques des Liquides et leur application à l'Analyse, 1882. From the AUTHOR.
Meyer (H.), Zur quantitativen Bestimmung der gesammten Alkaloïde der Chinarinde, 1882. From the AUTHOR
Ralfs (J.), British Phænogamous Plants and Ferns 1839. From Mr. C. B. ALLEN
Schuppe (N.), Beiträge zur Chemie des Holzgewebes 1882.
Separat-Abzug aus den Sitzungsberichten der Dorpater Naturforscher-Gesellschaft, 1882. 2 pamphlets. From Professor DRAGENDORFF.

The Committee recommended the purchase of the undermentioned works:—

British Homœopathic Pharmacopœia, 3rd ed., 1882.
Darwin (C.), The Movements and Habits of Climbing Plants, 1882.
Luerssen (C.), Medicinisch-pharmaceutische Botanik, 1879–82, 2 Bände.
Quain (R.), Dictionary of Medicine, 1882.
Stocken (J.), Elements of Dental Materia Medica and Therapeutics, with Pharmacopœia, 3rd ed., 1882.
Townsend (F.), Flora of Hampshire.
United States Pharmacopœia, 1882. 2 *copies.*
Journal of the Chemical Society. Sundry numbers to complete.

An application for the loan of microscopic slides having been laid before the Committee, it was decided that it is not advisable that slides should be lent out of the Society's building.

Curator's Report.

The Curator had reported the average attendance in the Museum during November to have been:—

	Total.	Highest.	Lowest.	Average.
Morning .	395	26	2	15
Evening .	104	13	0	5

The attendance during the year 1882 showed a slight increase over that of the previous year:—

	1881.	1882.
Morning	3071	3089
Evening	774	894
	3845	3983

The following donations to the Museum had been received, and the Committee recommended that the usual letter of thanks be sent to the respective donors:—

Leaves of *Croton balsamiferum.* From Mr. EADE.
Unusually fine specimens of Orris Root, China Root and Zanzibar Amine. From M. CHANTRE.
Specimen of Spurious Opium found mixed with the genuine. From Mr. J. R. YOUNG.
Three specimens of *Endogenites erosa* from the Sussex Wealden. From Mr. G. A. KEYWORTH

Herbarium specimens of *Erigeron Philadelphicum*.
From the DIRECTOR OF THE ROYAL GARDENS, KEW.
Specimen of Aloin and Tribromo-Aloin from Jafferabad Aloes.
Crystalline mass of Xanthate of Potassium.
From Mr. F. H. ALCOCK.

The Professors had reported satisfactorily of their respective classes.

The Secretary had reported that he had written to the India Office asking that further specimens of Cinchona barks grown in India might be forwarded to the Museum, and had received a reply stating that his request had been forwarded to India with the desire that it might be complied with as fully as possible.

It was also reported that the President had been in correspondence with the Colonial Office respecting the forwarding of drugs, colonial products, and papers relating thereto, to the Museum of the Society, and had received a promise that it should be done.

The Committee had ordered the Library and Museum be closed for the usual period during the Christmas vacation.

The report was received and adopted unanimously.

GENERAL PURPOSES.

This report, which was taken in committee, consisted merely of the usual letter from the Solicitor respecting cases which had been placed in his hands. He reported that—

R. Preston, Bury, had paid the penalty and costs.

Thomas McCreath, Newton Stewart, had paid a penalty and costs; and

John Lawson, Newton Stewart, had also paid a penalty and costs.

The report was received and adopted.

CORRESPONDING MEMBERS.

The PRESIDENT then moved the following resolution:—

"That it is desirable to institute a class, limited in number, of Corresponding Members, to consist of such persons as have distinguished themselves in pharmacy, or any of the branches of knowledge embraced in the educational objects of the Society.

"The class of Corresponding Members shall consist of persons who reside permanently *outside* the limits of the United Kingdom.

"The election of Corresponding Members shall take place annually in the same manner and under the same conditions as Honorary Members.

"That it be referred to the Library, Museum, Laboratory and House Committee, to consider and report what limit should be fixed as the number of such Corresponding Members, and as to the best way of carrying out the foregoing resolutions."

He said he would remind the Council that in almost all societies interested in the advancement of science and knowledge generally there are two classes of non-paying members, men whom it is desired by the Executive of such societies to have within their fold, but who are not liable to pay the subscriptions of ordinary members. They are honorary members in the one case, and corresponding members in the other. Honorary members are men distinguished either at home or abroad, whilst corresponding members are drawn from countries outside that in which the society has its existence. The Pharmaceutical Society, at different times, had received very great encouragement from distinguished pharmacists abroad, some of whom were also eminent chemists, physicists and botanists, but it had been out of its power hitherto, except in a few cases, to show its appreciation of their interest in British pharmacy by conferring upon them any title. He felt sure that this resolution, which proposed to allow the Council the opportunity of doing so, would commend itself, not only to his colleagues, but to the Society at large. There were many distinguished men who had worked for pharmacy and sent papers to the Journal, and some of whom had actually come to the Society's house and taken part in the deliberations for the advancement of pharmacy, but who resided on the Continent, in the United States, India, Australia and other places. There were many, also, who correspond with the Society's officers, and who show generally an active interest in the efforts of the Society, and he felt that their co-operation would be fittingly acknowledged by enrolling them as corresponding members. To many of these distinguished men the privilege of an honorary member would be practically unavailable, but the status of a corresponding member would be applicable to a large number of them. Having regard to these facts, and also to the fact that the bye-laws evidently contemplated the formation of this class, he begged to move the resolution standing in his name.

The VICE-PRESIDENT, in seconding the motion, said that as the list of honorary members was necessarily very restricted it became impossible to recognize the services of all the distinguished men whom the Society would like to honour. There were many gentlemen around the table and other members outside who had been recognized by continental and other societies, and it seemed to be only right for this Society to take the subject into consideration. He wished to know if it were intended to send any stamped document or diploma to the gentlemen elected—something beyond a mere letter of recognition from the office.

The PRESIDENT said the third paragraph of the motion was intended to convey that corresponding members would receive the same sort of respect as the honorary members and be furnished with a diploma, so that they would have a permanent record of the honour conferred upon them.

Mr. BUTT asked if it were proposed to restrict the number.

The PRESIDENT replied that a number would probably be fixed from time to time.

Mr. GREENISH said the motion met with his hearty approval, for he felt it was a movement in the right direction. Hitherto the two titles of honorary and corresponding members had been combined; but it was usual with foreign societies to confer honorary membership on some gentlemen and corresponding membership on others, and he was quite sure that a large number of foreigners, scientific gentlemen who had supported the Museum and the Society generally, would be gratified at having this title conferred upon them. He had a letter in his pocket from one resident in Belgium who had sent a large number of works from time to time to the Society, and such were the men on whom the corresponding membership should be conferred. It was perhaps unfortunate that the honorary membership should be limited to fifty, but it was certainly not desirable that the list should be too large. A few years ago it was almost entirely filled up, so that the Council could only elect additional honorary members as those already on the list died off. Just at the present time, when the Society had been honoured by the presence at the International Congress of so many gentlemen from abroad, it was particularly desirable that something of this kind should be done.

Mr. WILLIAMS said he had not the slightest doubt about the desirability of this resolution, but hitherto in electing honorary members the two titles had been united, and it was a question in his mind whether it would not be wiser to enlarge the number of honorary members and have only one list. He did not at all oppose the proposition that the number of honorary or corresponding members should be very much extended, but he thought it might be preferable to keep to one grade of honorary members.

Mr. BOTTLE asked if it were proposed that these corresponding members should be honorary members.

The PRESIDENT said they would not pay any subscription.

Mr. BOTTLE said in that case they would be honorary members. They must come within the category of those mentioned in the bye-laws as honorary and corresponding members.

The PRESIDENT said as he read the bye-laws he took them to be two separate classes, although it had been the practice hitherto to consider them as one.

Mr. BOTTLE said in one place in the charter they were spoken of as honorary or corresponding members, but everywhere else they were spoken of as honorary and corresponding members. He did not wish to oppose the motion in any way, but it appeared to him the fair construction of the bye-laws was that they applied to one class only.

The PRESIDENT said that in the diploma the title "honorary member" alone was used. Of course all corresponding members might be said to be honorary, and some of them might eventually be elected to the class of honorary members.

The motion was put and carried unanimously.

REPORT OF EXAMINATIONS.

December, 1882.

ENGLAND AND WALES.

	Candidates. Examined.	Passed.	Failed.
Major (13th)	6	2	4
„ (14th)	7	4	3
	— 13	— 6	— 7
Minor (13th)	12	7	12
„ (14th)	18	7	11
„ (19th)	24	12	12
„ (20th)	24	14	10
„ (21st)	24	9	15
	—109	—49	—60
	122	55	67

Preliminary Examination.

Ten certificates were received in lieu of the Society's examination:—

4 College of Preceptors.
1 Faculty of Physicians and Surgeons of Glasgow.
1 Royal College of Surgeons in Ireland.
2 University of Cambridge.
1 „ Edinburgh.
1 „ Oxford.

SALE OF PATENT MEDICINES.

The PRESIDENT reported that a communication had been received from the Honorary Secretary of the Nottingham and Notts Chemists' Association, enclosing a resolution passed at a meeting, held December 19, in favour of procuring a repeal of that portion of the Pharmacy Act which excluded stamped proprietary articles from the operation of the poison regulations.

Parliamentary and Law Proceedings.

POISONING BY "SYRUP OF CHLORAL HYDRATE."

An inquest was held last week at Saxonbury Lodge, Ryde, on the body of Lady Petre, widow of the late Hon. Arthur Petre, and daughter of the late Earl and Countess of Wicklow. The deceased lady retired to rest on Wednesday evening in her usual good health. As she did not rise at her accustomed hour the governess went into her room and found her in a convulsed attitude on the bed. By her side was a bottle of chloral, which had been fetched for the deceased the day after Christmas Day, and from which no less than sixteen teaspoonfuls had been taken in two days. The bottle was labelled "Syrup of chloral hydrate, dose one teaspoonful."

The deceased lady's son-in-law, Mr. J. S. Powell, of Hamberton Park, Maryborough, Queen's County, said he was aware that Lady Petre took chloral for sleeplessness, but did not know whether she had been ordered to do so by a medical man. He did not think she was at all likely to commit suicide.

Mr. Rich, surgeon, Ryde, said he thought her ladyship died from heart disease while under the influence of chloral. Of course he could not say that was so without a *post-mortem* examination. He pointed out that people began with small doses of chloral, which they kept increasing till they could take as much as 80 grains, and that the practice of taking chloral to induce sleep weakened the heart.

The Coroner said he would order a *post-mortem* if the jury wished it, but he thought it unnecessary. It was, in his opinion, clear that the deceased took the chloral inadvertently.

In this view the Jury concurred, and returned a verdict to that effect, and expressed an opinion that the bottle ought to have been labelled "Poison."

POISONING BY PRUSSIC ACID.

On Saturday, Dec. 30, the Coroner for Central Middlesex held an inquiry as to the death of John Maplestone, aged 51, which was supposed to have resulted from poisoning by prussic acid. It appeared from the evidence that deceased obtained from a medical friend some prussic acid in a bottle with the object of poisoning a cat. Some time after he was found in the pantry, lying on his back on the floor, as if he had fainted, whilst a cat was in the room in a very excited state. On medical aid being obtained he was found to be dead. There was a saucer on the table, which had contained sardine oil and prussic acid. The cat was known to be exceedingly fond of sardine oil, and it was subsequently discovered by the vomit about the floor that the sardine oil and prussic acid had been administered to the cat. On the shelf was the bottle which had contained the prussic acid. It was therefore suggested that if the death of the deceased was due to prussic acid it must have resulted from some misadventure, as he had no cause to destroy himself, but on the contrary, every reason why he should desire to live. He was on excellent terms with everyone.

Mr. Rayner, the summoning officer, stated that he had searched deceased's property and papers, and could find nothing to throw light on the matter.

The Coroner remarked that there was no doubt of the fact that deceased's death was from taking prussic acid, but what caused him to do so was a mystery. He had frequently held inquests where persons had committed suicide without any assignable cause.

The Jury ultimately returned a verdict "That the deceased died from the effects of prussic acid poisoning self-administered, but whether with the intention of suicide or otherwise there was not sufficient evidence to show."

Review.

THE YEAR-BOOK OF PHARMACY. Comprising Abstracts of Papers relating to Pharmacy, Materia Medica and Chemistry contributed to British and Foreign Journals from July 1, 1881 to June 30, 1882, with the Transactions of the British Pharmaceutical Conference at the Nineteenth Annual Meeting held at Southampton, August, 1882. London: J. and A. Churchill.

Not an unimportant measure of the success enjoyed by the British Pharmaceutical Conference is without doubt attributable to the annual publication of a Year-Book of Pharmacy, and its free distribution among its members. The reflex influence resulting from this act would alone form a necessary factor in any estimate of the numerical

strength of the body. On the other hand the eagerness manifested on the part of its members to possess themselves of this work at an early date may surely be regarded as an indication of their appreciation of its worth.

In size, the present volume is within six pages of last year's issue, which it further resembles, both in regard to the subjects into which it is divided and the manner of their arrangement. The conventional sixteen pages at its commencement, though less closely printed than usual, take the form of an introduction. Although this constitutes mainly a connected summary of the scope of the work, it is perhaps the more valuable as affording a means by which the reader is enabled to judge of the advance which pharmacy and its allied branches have made during the past year.

The subject of "Chemistry," Part I., embraces one hundred and twenty-five pages. Here we are pleased to note the space which has been devoted a careful digest of the physiology and chemistry of chinoline and its compounds. No less than five abstracts, taken from the papers of eminent English and continental investigators, appear on this newly discovered medicament. Information not less helpful to the pharmacist will be found under pilocarpine, emetine, etc. The man, too, of more purely scientific tendencies will find his tastes gratified and a field for revelry in the contemplation of such products as monochlormethylnoropianic acid, a derivative of opianic acid, and pyroguajacol, a product of the dry distillation of guaiacum. The chemistry of the cinchona bases and the various products derivable therefrom also receive a large share of attention, and the results of the several workers will probably be studied with unabated interest by specialists.

Not a few, too, of the analytical methods which have been published during the year are here presented in a succinct form.

Part II. comprises "Materia Medica and Pharmacy," and is contained within the more moderate bounds of ninety-six pages. It is more particularly this section and the succeeding one on "Notes and Formulæ" that renders this book an indispensable desk companion to the busy pharmacist. As a work of reference we note with satisfaction that its usefulness has not been sacrificed by overloading it with *minutiæ* of detail pertaining to methods having reference to the extraction of plant principles. The results of the proximate analysis of plants are clearly expressed, while the processes employed are stated in general terms. We would suggest that to a description of those drugs more recently introduced into medicine should be appended a note upon their therapeutical action and dose.

Part IV. is entitled "Bibliography," comprising titles of books, pamphlets, etc., on chemistry, botany, materia medica, pharmacy and allied subjects, published between July, 1881, and June, 1882. This section, which now appears for the second time, undoubtedly supplies a demand, but it occurs to us that it might give the desired information without occupying a space of equal dimensions with materia medica and pharmacy. Adverting to the transactions, we have here given, in alphabetical order, the names and addresses of all the members of the Conference, but we nowhere find any mention of the exact number. From the report of the executive committee we learn that fifty-seven gentlemen have been elected members since the last year. It is gratifying to be told that as the result of an invitation issued to colonial pharmacists to become members, twenty have applied in the affirmative. The comparative freedom from clerical errors which characterizes the transactions is a continued proof of the great care with which it is edited; but on p. 446, four lines from the bottom, the word *not* is omitted in the sentence "there would be an equivalent quantity of iodine liberated," and again, on p. 471, the abbreviation *per cent.* is left out in the sentence reading "8 solution of caustic soda."

Obituary.

Notice has been received of the death of the following:—

On the 19th of December, Mr. William Hardcastle, Chemist and Druggist, Stockton-on-Tees. Aged 72 years.

On the 22nd of December, Mr. Alfred Driver, Chemist and Druggist, Royal York Crescent, Clifton. Aged 35 years.

On the 28th of December, at Sheffield, Mr. Edward Wilson, Pharmaceutical Chemist. Aged 57 years. Mr. Wilson joined the Pharmaceutical Society in 1853, and continued a Member up to the time of his retirement from business in the year 1877. He generously supported and took great interest in the Benevolent Fund.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

The Preliminary Examination.

Sir,—Although outside the pharmaceutical world, I frequently read your paper. I am a B.A. and L.C.P., and having been a tutor for many years I claim your indulgence in allowing me just a small space to make a few remarks on the Preliminary examination. My experience as a tutor is by no means limited, having followed my profession for nearly twenty years, during which time I have had scores of youths to prepare for the Preliminary examination. I contend that the fact of a boy passing the Preliminary is by no means a test that he has been properly educated, and especially in the Latin subject, and the only way by which this may be remedied is to adopt the plan used by the examiners for the legal profession, that is change the subjects twice yearly (the Latin authors). I have had a boy who could translate the first book of Cæsar well,—indeed, you need only give him the beginning of a chapter and he would say the rest off by heart,—still, if I were to ask him the simplest question about the grammatical construction of a sentence, he would be completely dumbfounded. On December 9, at a meeting of the Pharmaceutical Council, a gentleman remarked that the Preliminary examination of the College of Surgeons contemplated one Latin author only. This is true, but the examination is altogether different from the pharmaceutical, inasmuch as the 'Anab.' of Xenophon, Book I., has to be translated into English, or a passage from a French work into English, besides English into French, algebra, Euclid (books I., II.), geography and history, so that the two examinations cannot be well compared as regards severity. If, as suggested, the first book of the 'Æneid' were added, even then the examination would be far below the standard of the Oxford and Cambridge locals. It appears to me that the Council wish to make it equal to the two latter examinations, and I must express my entire concurrence, for any well-educated schoolboy should pass the Oxford or Cambridge examinations with ease. Taking into consideration that there is no French, German, or Greek to be learnt, as for the medical and legal examinations, I think two Latin authors should be taken at least, say—

January	} Cornelius Nepos.
July	} Cæsar D. B. G. Lib. I.
April	} Cæsar D. B. G. Book II.
October	} Virg. Æneid, Lib. I.

And a wider range of arithmetic to compensate for the Euclid and algebra. A boy well up in his Latin grammar would be able to get up any two of the above books in eight or nine weeks. A good examination in analysis should be added to the English paper.

A. W. S.

Communications, Letters, etc., have been received from Messrs. Dewson, Radley, Sangster, Lime Juice, Sanitas, S. G., A. W. S.

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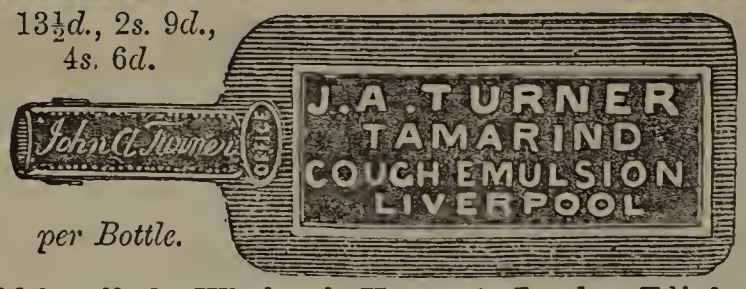

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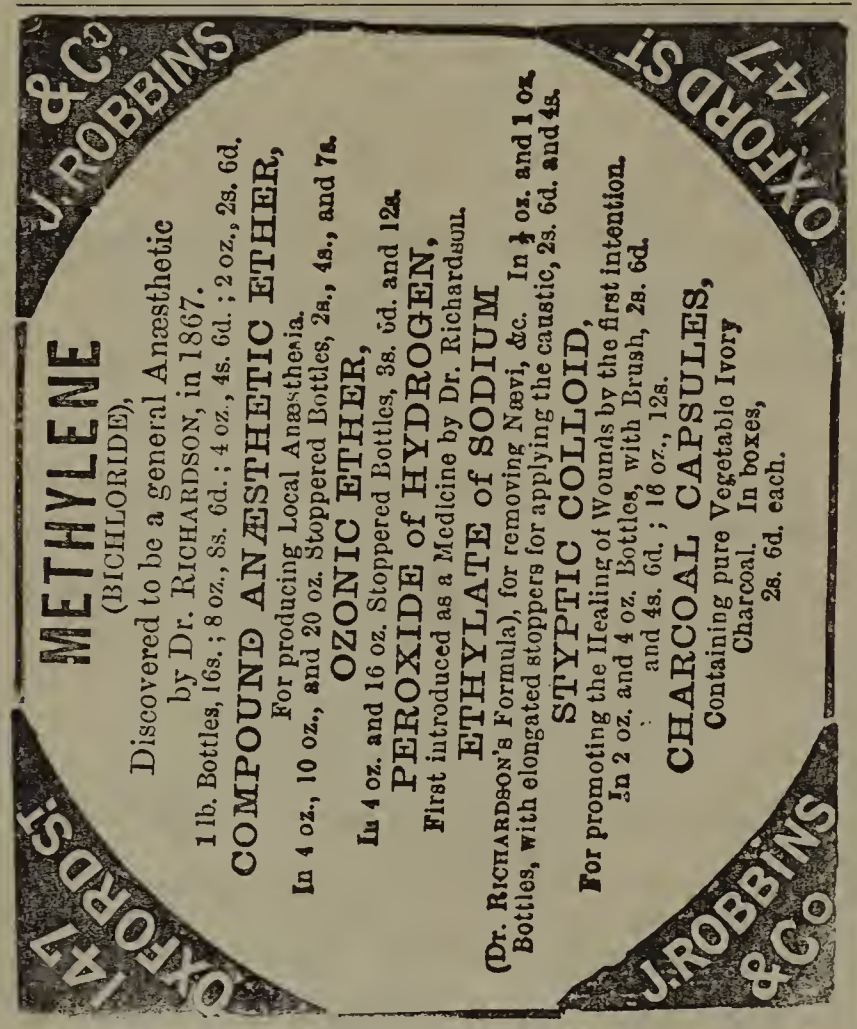

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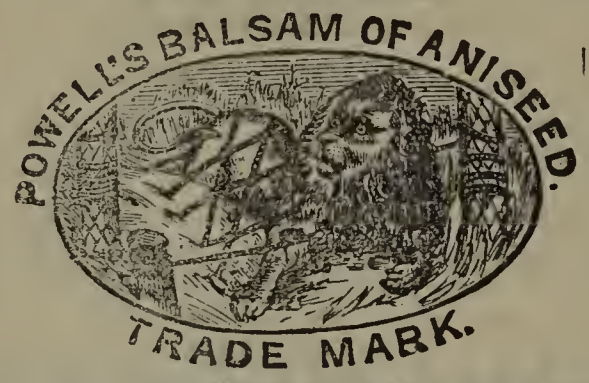

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Prospectus and samples free on application.
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TWO of my Students presented themselves at the December Minor; BOTH passed.

Laboratory close to Gower Street Station.

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LONDON Matriculation, College of Preceptors, Apothecaries' Hall, Glasgow, Edinburgh, and all Medical Preliminaries. Rapid and thorough preparation, privately and in class. Also postal tuition for these examinations and Bell Scholarship. For particulars enclose stamp, Mr. Dawes, 1st B.A. (Lond.), 11, Burton Crescent, London, W.C.

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PRELIMINARY.—Arithmetic and Metric System, 1s. How to Write an Essay, 6d. Latin Grammar and Cæsar Simplified, 1s. Minor.—Equations Simplified, 1s. Illegible Autograph Prescriptions, 1s. Minor Questions, gratis. Notes on Dispensing, 1s. Prescriptions given at the Minor, 1s. For "How to Prepare for either Exam.," enclose stamped envelope, Chemist, care of Mr. J. Edwards, Wye, Kent. Herbarium of Plants, 6s.

THE

CENTRAL SCHOOL OF CHEMISTRY & PHARMACY

Laboratory and School Buildings:

173, MARYLEBONE ROAD, N.W.

At the recent Examinations held in December, 3 Major candidates presented themselves from this School, the following 2 passed:—

*Mr. J. J. MARSHALL. | *Mr. W. J. WILLIAMS.

14 presented themselves at the Minor Examination from this School, the following **11** passed:—

*Mr. C. BING.	Mr. J. T. LAMBERT.
* „ G. BRISLEY.	* „ F. C. LANGLEY.
* „ A. HOLWELL.	* „ C. L. PERKINS.
* „ W. R. HOPKINS.	* „ C. RIDGLEY.
„ W. J. JENKIN.	* „ H. E. SKYRME.

*Mr. G. RIGDEN.

* These gentlemen passed the first time of their presentation.

For Prospectus apply to Messrs. LUFF & WOODLAND.

"SYSTEMA OMNIA VINCIT."

SOUTH LONDON SCHOOL of PHARMACY

325, KENNINGTON ROAD, S.E.

Director: Dr. JOHN MUTER, M.A., F.I.C., F.C.S., &c.

FOURTEENTH SESSION, 1882-3.

THE NEXT TERM WILL COMMENCE ON JANUARY 8, 1883.

For Syllabus, &c., apply to W. BAXTER, Secretary.

"CONCILIO ET LABORE."

THE MANCHESTER *COLLEGE OF PHARMACY,*

225, OXFORD STREET, MANCHESTER.

Mr. W. S. TURNER, Pharmaceutical Chemist, M.P.S.

At the Minor Examination held in London in December, FIVE Students from this School were examined, ALL passed, viz.—

Mr. W. G. BLACKHAM Mr. W. F. GOODWIN
„ F. E. EASTWOOD „ J. G. ISAAC
Mr. E. RYLEY.

The next Session will commence on Monday, January 8th. It will include *both Day* and *Evening* Classes. Fees low and inclusive. "*No extras.*" Work thorough, straightforward and successful (no cram).

Lancashire, Cheshire, and West Yorks. Students please note and write for particulars.

THE WESTMINSTER COLLEGE OF CHEMISTRY & PHARMACY

LECTURER ON CHEMISTRY AND PHYSICS,
GEO. S. V. WILLS, F.L.S., F.R.M.S.
LECTURER ON BOTANY AND PHARMACY,
E. D. GRAVILL, M.P.S.
LECTURER ON MATERIA MEDICA AND DISPENSING,
W. WATSON WILL, M.P.S.
TEACHER OF MATHEMATICS AND LATIN,
H. WOOTTON, F.S.Sc.

The Course of Lectures and Classes for the February and April Examinations has just commenced.

FEES:

PRELIMINARY .	One Month... ...	£2 2s.
	Until Qualified...	£5 5s.
MAJOR or MINOR	February Exam.	£4 4s.
	April „	£8 8s.
	Until Qualified ...	£10 10s.
MAJOR AND MINOR .	Until Qualified ...	£15 15s.

By attending this College Students may be sure of receiving a thorough Pharmaceutical Education, as well as being efficiently prepared for their respective examinations.

At the Major Examination held this month, **3** Students were sent in from this College, **2** passed.

* Mr. A. NICHOL. | * Mr. T. RICHARDS.

* These Gentlemen passed both Minor and Major from this College AT THEIR FIRST ATTEMPT.

MINOR EXAMINATION.

24 Students passed the Test Examination of the College, and the following were successful in passing the Minor examination, last month, from the Westminster College:—

Mr. P. CARR	Mr. T. E. PASK
„ A. B. CHATER	„ C. PUCKEY
„ H. S. COLLINS	„ W. R. REDNALL
„ WEBSTER COX	„ JOHN A. REES
„ H. CRITCHLOW	„ A. W. SMALLEY
„ J. H. FREEMAN	„ W. T. SMITH
„ R. W. HOUFE	„ F. M. WALTON
„ C. M. LUXMOORE	„ HENRY WHIFFIN
„ W. JONES	„ R. J. YOUNG
„ C. H. M. PARKER	

The majority of the above passed at their FIRST ATTEMPT. We do not, however, place a mark against their names, as it is contrary to the wish of those who have been unsuccessful on a former occasion.

For Prospectus and other information, apply to

Messrs. WILLS & WOOTTON,
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3.–That all letters respecting the insertion of Advertisements should be endorsed on the envelopes "**PHARM JOURN,**" and must be sent only to the Publishers,

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Students can enter at any time.

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EDINBURGH SCHOOL OF PHARMACY AND CHEMISTRY,

MARSHALL STREET, NICOLSON SQUARE.

The Sessions open at this School in May, October, and January. ONE Session's Attendance has hitherto been found sufficient to secure success. For particulars apply to—

R. URQUHART, *Secretary.*

ENGAGEMENTS WANTED.

AS JUNIOR or IMPROVER. 3 years' experience. Accustomed to light Retail and Dispensing business. Age 18. C., c/o Mr. Cooper, Kingston Cross, Portsmouth.

WHOLESALE.—As ASSISTANT. London and country experience. Excellent references. RHEI, 20, Jarratt St., Hull.

AS ASSISTANT. In or out-door. Or MANAGE small Branch. Age 24. 6 years' experience. Good Dispenser. Shortly disengaged. A. B., 1, King's College Rd., Adelaide Rd., N.W.

A YOUNG gentleman, who has spent part of his apprenticeship, is desirous of obtaining a comfortable situation. Salary no object. MEDICUS, Mr. Vause, Crambeck, Welburn, York.

AS ASSISTANT, MANAGER, or otherwise. Major qualification. Age 30. Single. 14 years' experience. Salary £40, in-doors. W. HARRISON, Gedney, near Holbeach, Lincolnshire.

A YOUNG man studying for the April Minor, wishes for evening employment. In-door. Near Westminster College preferred. Age 21½. London experience. QUERCUS, Croft House, Earlsheaton, Dewsbury.

AS MANAGER, temporary, by a gentleman of long experience. Disengaged. M. P. S., Wadenhoe, Bournemouth.

ABOUT the third week in January.—As qualified ASSISTANT in good class business. Good references can be given. Age 23·9. W. O. SAUL, 2, San Francisco Ter., Boston, Lincolnshire.

APPRENTICE or IMPROVER.—To place a youth of 18, with some little experience, in a good house of business. In London or suburbs. A. K., care of H. Bacon, Fleurier Villas, Hanworth Rd., Hounslow.

ADVERTISER, just recovered from illness, desires a light situation at small salary. Age 30. Used to good Dispensing, Retail and Prescribing. Total abstainer. D., 147, Great Portland St., W.

ADVERTISER, calling on Chemists in Birmingham and Midland Counties with speciality, is willing to sell on commission for other respectable houses. R., 5, Trinity Rd., Birchfields, Birmingham.

TEMPORARY. Ætat. 31. By day, week, or month. Town or country. Thoroughly experienced in all branches. Irreproachable references. Terms very moderate. Disengaged. A. WOOD, 4, Woodfield Cres., W.

DRUG Trade.—By a Registered Chemist. LOCUM TENENS or MANAGER, temporary or permanent. Thoroughly experienced, town and country. Good Prescriber, Dispenser. References given. HOLE, Westbury, Wilts.

AS ASSISTANT or to MANAGE a small Branch, with the object of purchasing the same after 12 months. Full particulars to CHEMIST, Old Hill, Dudley.

AS LOCUM TENENS or MANAGER. Minor qualification. G. H. JONES, Mabel House, Clarendon Rd., Walthamstow.

PART-DAY engagement in return for board and lodging. In London or suburbs. Aged 22. Passed Minor. X., Mr. Ridgley, Huntingdon.

AS ASSISTANT or to MANAGE Branch. Age 30. Married. A permanency desired. Good references. ALPHA, 23, Bankhouse St., Burnley.

ENGAGEMENTS WANTED.

AS IMPROVER in good class business. In or near London. Passed Preliminary. Age 18. Height 5ft. 9in. Disengaged. D. T., Lake St., Ferndale, Pontypridd.

OUT-DOOR. As ASSISTANT to Chemist, or DISPENSER to Surgeon. Good experience and references. Age 32. Married. Can Extract Teeth. W. H. P., 7, Park Lane, The Hythe, Colchester.

LOCUM TENENS, or Temporary ASSISTANT. Qualified. By the day, week, or month. Town or country. CHEMICUS, 6, Manchester St., Gray's Inn Rd., W.C.

EVENING employment by Major student, in lieu of partial board, lodging and small salary. CHEMICUS, 2, Bonchurch Rd., Notting Hill.

AS JUNIOR in a good class business. Age 20. 4 years' experience. Highest reference. London preferred. A. B., Mr. Price, Chemist, Abergavenny.

AS JUNIOR. In London. Age 20. 4 years' experience in Dispensing and Retail. Good references. A. J. GIBBONS, 32, High St., Bristol.

EVENING employment. Disengaged at 5 p.m. Good references. M. A. B., 29, Wood St., Princes Rd., Kennington.

AS ASSISTANT, in or out-door. In or near London, or abroad. Minor and Hall qualifications. Good references. H. WHIFFIN, Bedford.

AS ASSISTANT. Out-door. Age 27. Good references. Disengaged. D. A., 98, Dalyell Rd., Stockwell.

AS ASSISTANT, with time for study. Height 5ft. 5in. Passed Preliminary. Salary moderate. H. S., The Clapton Drug Stores, 3, Five Elms Ter., Lower Clapton, E.

AS ASSISTANT. At once. In London. Time required for study. Ætat. 22. In or out-door. C. L. S., Orchard House, Langham, Blakeney, Norfolk.

AS ASSISTANT. Age 25. 9½ years' experience. Excellent references. F. E. LEWIS, "Advertiser" Office, Peterboro'.

AS ASSISTANT. Disengaged. In or near London preferred. Age 22. Height 5ft. 6in. 6 years' experience. Minor and Hall qualifications. PHARMACY, Clackett's Library, Fakenham, Norfolk.

AS MANAGER, Branch or otherwise, by a Registered Chemist. Aged 45. Experienced in good class Retail, Dispensing and Prescribing. Temporary entertained. B. C., 47, Ovington St., Chelsea, S.W.

AS ASSISTANT, by a German. Speaks English perfectly. 12 years' experience. 4 years in England. 2½ years in West-end establishment. Good references. T. L., 16, Tichborne St., Quadrant.

AS JUNIOR, in good Dispensing business, or Surgeon's Retail. 6 years' experience with M. D., and extensive practice in Laboratory and Dispensing. Age 21. Carte sent. J. E. KEY, 38, Manthorpe Rd., Grantham.

AS JUNIOR or IMPROVER. 5 years' experience with a Surgeon. Age 19. Passed Prelim. Height 5ft. 10in. Salary no object. Excellent references. G. STAFFORD, 29, Broad St., Welshpool.

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BY advertiser.—11 years' varied experience. Would not object to temporary. Disengaged. MINOR, 2, Myrtle St., Douglas.

WHOLESALE Druggists and Druggists' Sundrymen.—A gentleman, 37 years of age, thoroughly conversant with Warehouse and Counting-house work, is open for engagement. Moderate salary. W. B. F., 158, Highbury Hill, N.

ENGAGEMENTS WANTED.

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AS TEMPORARY, or with time allowed for study. Age 22. Good references. CORTEX, 33, West Sq., Southwark, S.E.

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A JUNIOR ASSISTANT, by W. DARLING, Homœopathic and Pharmaceutical Chemist, 126, Oxford St., Manchester. One who has had some experience in Homœopathy preferred.

A JUNIOR ASSISTANT, with Minor qualification. Apply to GLAISYER & KEMP, Brighton.

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PUPIL.—A Pharmaceutical Chemist in the West-end of London is desirous of meeting with a youth of about 17 years of age, who has been well trained and has received a good middle class education. He will have the constant personal supervision of his master, and will have every opportunity given him for acquiring a good sound knowledge of the business, and of making himself a capable pharmacist. He will be required to reside on the premises, and will be treated in all respects as a member of the family. The advertiser would prefer one who has passed or is qualified to pass the Preliminary examination of the Pharmaceutical Society, or some equivalent examination, enabling him at once to register himself as an Apprentice of the Society; also that he should be a member of the Church of England. A premium will be required. Apply, in the first place, to PHARMACIST, care of Messrs. Herrings & Co., 40, Aldersgate St., London, E.C.

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WHOLESALE. — A WAREHOUSEMAN. Must have thorough knowledge of his work. Apply, stating previous engagements, references, and salary expected, to Y. & Co., care of Messrs. Horner & Sons, Mitre Sq., London, E.C.

APPRENTICE.—A smart gentlemanly youth, about 16, as APPRENTICE to an old established Mixed business. In-doors. Comfortable home and every opportunity for acquiring a thorough knowledge of the business. References given and required. Premium moderate. P. SMITH & Co., Runcorn.

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J. DUTTON & SON, Rock Ferry, Birkenhead, require a good ASSISTANT (Retail and Dispensing). Address, with particulars, references, &c., as above.

AT once.—An ASSISTANT for a small country business. To take charge occasionally. An energetic and agreeable young man. Small salary. Comfortable home. Address, I. J. REEVE, Chemist, Newhaven, Sussex. Good references required.

APPRENTICE.—A well educated youth, about 16, as APPRENTICE to a good class country trade. One who has passed the Preliminary preferred. Comfortable home. Moderate premium. MELLOR, Chemist, St. Neots, Hunts.

A JUNIOR ASSISTANT for Dispensing and light Retail business. Apply, R. HISCOCK, 17, Broad Gate, Coventry.

A JUNIOR ASSISTANT, about 22 years of age. Must be a good Dispenser. One requiring three hours daily for study could be treated with. Apply by letter, with full particulars as to age, height, past experience, references, and salary required, C., Messrs. Field & Co., 112, Camden Rd., N.W.

ASSISTANTS WANTED.

AN ASSISTANT, to proceed to India. Age about 26, and unmarried. Must have passed Minor examination. Four years' agreement. Salary, 1st year, 150 rupees, 2nd year, 200 rupees, 3rd year, 225 rupees, 4th year, 250 rupees, per mensem. Apply, by letter only, to Messrs. ALEX. LAWRIE & Co., 14, St. Mary Axe, London, E.C.

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JUNIOR.—R. MARTIN, 97, High Street, Maidenhead, requires a good Junior ASSISTANT. One acquainted with general country trade preferred. Address, with particulars, as above.

A JUNIOR who wishes to fill up his time, when not attending lectures, &c., from 2.30 to 8 p.m. daily, can apply by letter, stating salary required (out-door), to T. H., 12, Canonbury Pl., Islington, N.

BY the beginning of February.—An energetic, obliging and thoroughly competent ASSISTANT, to Manage a chemist's business in a western suburb. Testimonials to bear the strictest enquiry. Candidates will have to apply personally and pay their railway expenses. Salary £80 per annum, with unfurnished apartments. Address, enclosing testimonials (which will be returned), stating age, height, &c., to A. B., care of Messrs. Newbery & Sons, 1, King Edward St., Newgate St., London, E.C.

SURREY Dispensary (President, the Right Hon. the Earl of Egmont).—Assistant DISPENSER required. A meeting of the Monthly Committee of this Charity will be held at the Dispensary, Great Dover St., on Tuesday, the 23rd inst., at 6 o'clock precisely, to appoint an Assistant Dispenser. Gentlemen desirous of becoming candidates for the same are required to be in attendance as above to produce testimonials and necessary qualifications, either from the Pharmaceutical Society or the Apothecaries' Hall. Salary £60 per annum. The duties consist in dispensing and compounding medicines for the patients between the hours of 9 a.m. and 2 p.m., or until the business of the morning is finished. Any further particulars can be obtained either at the Dispensary or of

FRANCIS J. T. MOORE, Secretary.

98, Cannon St., E.C., 3rd January, 1883.

IMMEDIATELY.—Assistance of an evening, principally to keep up stock. Permanent. Address or apply to W. WICKHAM, Pharmaceutist, 509, New Cross Rd., S.E.

A COMPETENT Senior ASSISTANT, accustomed to first-class country trade. Liberal and progressive salary for experience, good address, and thorough business habits. State age, height, salary required, and enclose carte. CHAVE & JACKSON, Pharmaceutical Chemists, Hereford.

A GOOD Dispensing ASSISTANT. State age, reference, qualifications, salary, height, and enclose carte, to J. STEWART, 2, Royal Promenade, Queen's Rd., Clifton and Bristol.

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16FT. run Fixtures, 10ft. 6in. high, drawers, glass cases, lockers, shelving, &c., &c., £18 10s.; a 6ft. glass Wall Case to match, £15; 8ft. glass Wall Case, with glass cupboards under, £16; 3ft. 6in. glass Case for wall, 10ft. high, £8; nest of mahogany Drawers, gold labelled, with lockers under, 5ft. long, 5ft. high, 52 drawers, £5; 1 pair fancy iron Brackets for carboys, 40s.; a quantity Specie Jar and Carboy Stands, Show Steps and Stands, Perfume Stands, Soda Water Stands, Bottles, Jars, Carboys, Specie Jars, Scales, Lamps, Royal Arms. E. NATALI, 207, Old Street, near Pitfield Street, London, E.C.

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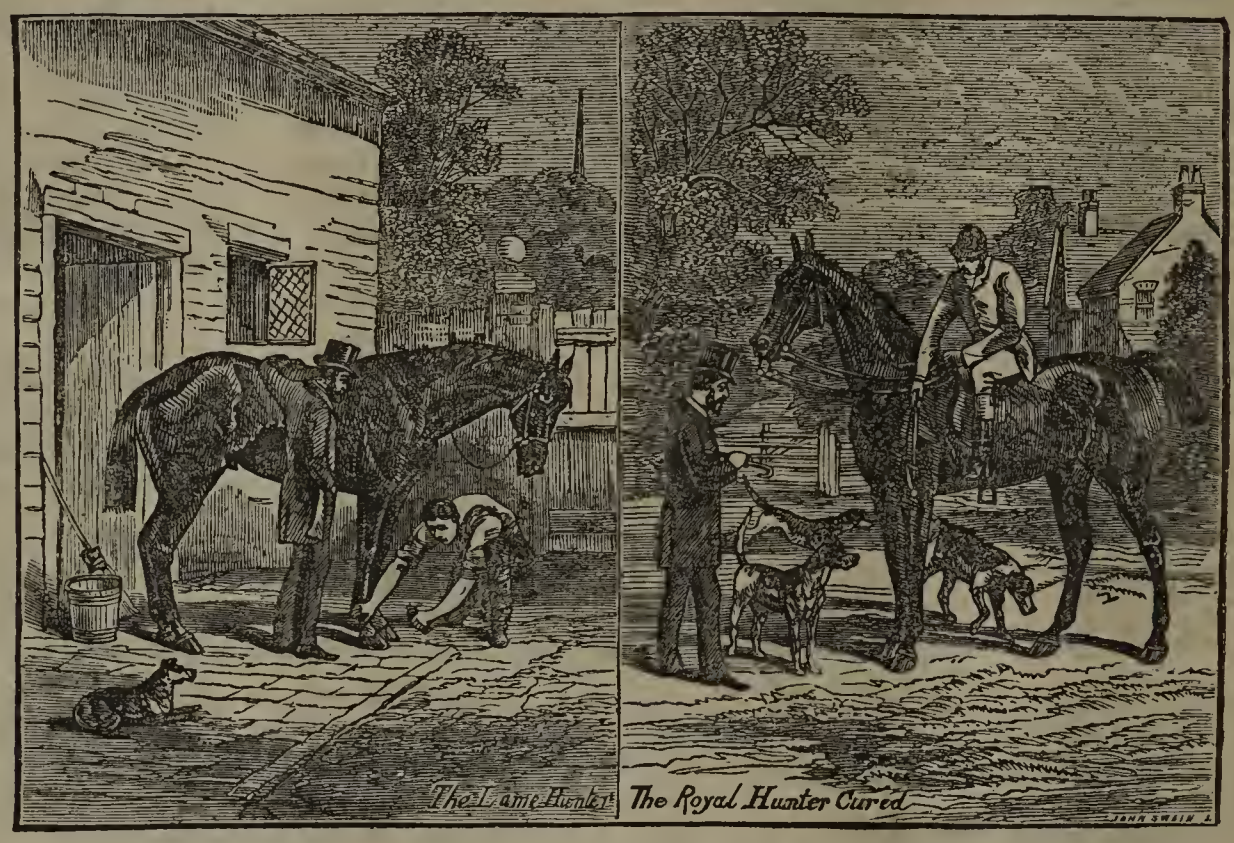

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From His Grace the Duke of Rutland, Master of Belvoir Hunt.

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From the Royal Hunt, Windsor Great Park.

Cumberland Lodge, July 4th, 1851.

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Pharmaceutical Society of Great Britain.

CATALOGUE

OF

ADDITIONS TO THE LIBRARY,

1882.

(*Note.—Books to which * is affixed are not circulated.*)

Abietineæ. Russow (E. [A. F.]), Über die Entwickelung des Hoftüpfels, der Membran der Holzzellen und des Jahrringes bei den Abietineen, in erster Linie von Pinus silvestris L., [1881].

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Candidates will receive notice of the date on which they will be required to present themselves.

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SPECIAL NOTE.

Each Candidate must state, at the time of giving notice, whether he desires to be examined in London or in Edinburgh.

EVENING MEETING.

The next EVENING MEETING will be held on Wednesday, February 7th, 1883, at Eight o'clock.

The Chair will be taken at half-past Eight *precisely*.

Papers intended to be read at that Meeting should be forwarded to the Secretary not later than Wednesday, January 31st, as papers received after that date cannot be announced in the *Pharmaceutical Journal* previous to the Meeting.

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The next Meeting will be held on Wednesday, January 17th, at 9 o'clock.

Mr. ALEXANDER NAPIER, President of the Branch, in the chair.

The following communications will be made:—

"Notes on the New Edition of the United States Pharmacopœia." By WILLIAM GILMOUR.

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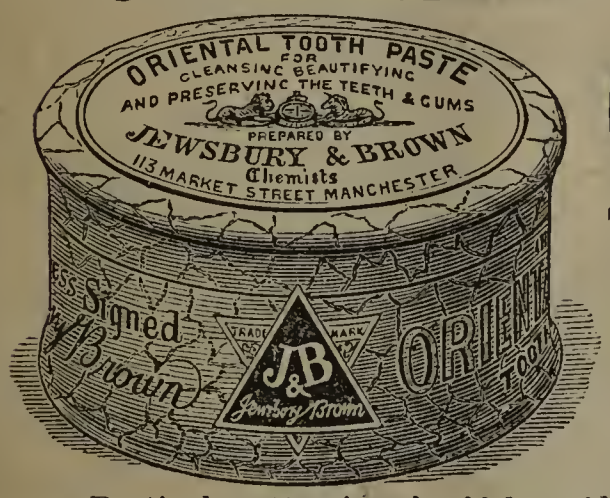

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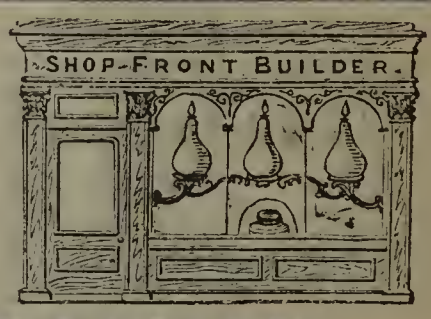

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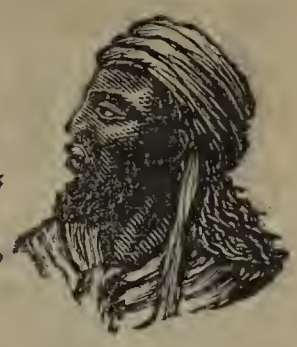

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THE NEW PHARMACOPŒIAS FOR THE UNITED STATES AND GERMANY.

(*Continued from page* 505.)

In commenting more in detail upon the articles contained in the two Pharmacopœias it is proposed to deal first with the animal and vegetable materia medica, then with chemicals and their preparations, and lastly with the galenical preparations. As a rule an alphabetical arrangement will be followed, and for convenience the sequence will be according to the actual name of the drug, as in the U.S.P., instead of according to that of the part used, as in the P.G. Exceptions to this rule, however, will be made in the cases of the balsams and essential oils.

I. Animal and Vegetable Materia Medica.

Absinthii, Herba, P.G.—The use of the cultivated as well as the wild herb is allowed. The time of collection is now omitted.

Aconitum, U.S.P., Tubera Aconiti, P.G.—The tuberous root is alone official, the leaves being omitted from the U.S.P. This is an advantage, since the leaves vary greatly in strength at different periods of their growth. The description now given in the U.S.P. permits the use of those roots only which are whitish internally and enclose a pith having about seven rays. This should ensure the rejection of horny and hollow roots, of which many are of uncertain value and doubtful botanical origin. The Japanese aconite (*Pharm. Journ.*, [3], xi., 1042), which is white and starchy internally, is also excluded, since the pith is not usually seven-rayed, but is surrounded by an irregular circle of vessels; even in the comparatively few specimens in which the pith is five-rayed, and which probably belong to a plant nearly allied to *A. variegatum* (the root of which has a five-rayed pith) the number of the rays and the smooth, plump appearance and more conical shape, will serve to distinguish it. Possibly it is with the view of excluding Japanese aconite, on account of its containing a distinct alkaloid and being more poisonous than the root of *A. Napellus*, that the P.G. now describes aconite as "tubera rapiformia," not "obconica" as formerly. The use of tubers that are brownish and hollow internally and of unequal size, which was permissible under the description given in the last edition, is now excluded by the simple statement that the roots are "farinosa vel granulosa" internally. In neither Pharmacopœia is it stated at what time of year the tubers should be collected, nor whether cultivated or wild plants should be used (*Pharm. Journ.*, [3], xiii., 234). It therefore remains for private enterprise to cultivate and supply a root which shall present the required characters, such being the exception rather than the rule in commerce at the present time.

Aconitine is omitted from both Pharmacopœias, possibly in consequence of the extreme variability in strength of the alkaloid as procurable in commerce, and of the deplorable results that have followed the use of a substance of which some samples are one hundred and seventy times as strong as others (*Pharm. Journ.*, [3], xi., 51; xii., 683). It may be hoped that the medical profession will also permit the alkaloid to drop out of use in this country and that thus the heavy responsibility which at present rests on the chemists who dispense it may be removed.

Adeps.—In the U.S.P. this is now directed to be kept in vessels impervious to fats, and directions are given for testing its freedom from alkalies, starch, common salt and water. In the P.G. the description is much longer than in the previous edition and directions are given for ascertaining its characters. The U.S.P. gives data as to the solubility of lard in benzine, ether and bisulphide of carbon. The P.G. directs that its character should be ascertained by the preparation with caustic potash of a soft soap, which should be soluble in 40 parts of warm water and in 10 parts of alcohol. The unguentum benzoini of the last edition of the U.S.P. is now placed under the better-known name of "adeps benzoinatus." Instead of being made with the tincture of benzoin it is now prepared of a strength and in a manner very similar to that of the British and Russian Pharmacopœias, the temperature not being allowed to rise above 60° C. (140° F.) during the process.

Allium, U.S.P.—A description of the bulbs is now given, followed by a sentence which is almost Irish in its incongruity, viz.:—"It should be preserved in a dry place and only used in the fresh state."

Aloe and Aloe Purificata, U.S.P.; Aloe, P.G.—Socotrine aloes is now the only kind official in the U.S.P., Barbadoes and Cape aloes having been discarded. It appears to have escaped the notice of the editors that Socotrine aloes is not produced, as was formerly supposed, by *A. Socotrina*, but by *A. Perryi*, Baker (*Pharm. Journ.*, [3], xi., 747). Socotrine aloes, as met with in commerce, varies so much, containing sometimes half its weight of mineral matter and sometimes as much as 25 to 30 per cent. of "resin," that the introduction of "aloe purificata" for use in the various preparations cannot be too highly commended as a step in the right direction, which might well be followed in the next edition of the British Pharmacopœia. The mode in which the purification is effected is, however, probably open to improvement, both as to the solvent and the temperature employed (*Pharm. Journ.*, [3], xii., 501). In the P.G., Cape aloes is still the only official kind. The tests now given are that a solution of 5 parts in 10 of boiling water, when cooled, should not yield more than 3 parts of deposit, that no colour should be given to boiling chloroform, and only a yellowish tint to ether. It should also be so free from moisture that it only softens, but does not melt at 100° C.

Althæa, U.S.P.—A description is now appended, from which it is evident that only the decorticated root is official. Marshmallow root is very apt to become mouldy and undergo change if kept in a damp atmosphere; directions to keep it in a dry place might, therefore, have been added with advantage.

Ammoniacum, U.S.P. and P.G.—In the P.G. the wording of the description has been altered. Specimens of a brown colour are not objected to. Two chemical tests are given, one with liquor sodæ, which should give a yellow and then a brown coloration to the aqueous emulsion, and the other with hydrochloric acid, which should not change the colour. The latter test distinguishes ammoniacum from galbanum, with which it gives a blue colour, but the former test might well be replaced by solution of chlorinated soda, which colours true ammoniacum but does not affect the African kind.

Amygdala amara and A. dulcis, U.S.P.; Amygdalæ amaræ and A. dulces, P.G.—The sweet almonds are now limited in the P.G. by

given measurements, which seem to apply to Valencia rather than to Malaga almonds; but in neither Pharmacopœia is any commercial variety specified.

AMYLUM, U.S.P.; AMYLUM TRITICI, P.G.—The description given in the U.S.P. applies to wheat starch in its pseudo-crystalline state, and permits of the use of starch which forms a white jelly having a bluish tinge, but provides against the presence of acids or alkalies. The P.G. orders powdered starch, but enters more minutely than before into its microscopical appearance, describing the different aspect of the granules when examined in water or alcohol, and the means by which potato starch may be recognized if mixed with that of wheat. The mucilage is required to be free from taste and odour. It is difficult to understand why potato starch should alone have been specified, since maize and rice starch are quite as likely to be mixed with it or substituted for it. Mineral substances, as heavy spar, etc., are detected by estimating the ash, which should not exceed 1 per cent. This is a tolerably difficult process, which might, with advantage, be replaced by that of heating with dilute sulphuric acid and boiling and adding an equal volume of alcohol to a portion of the clear solution, which should not become turbid.

AMYLUM IODATUM occurs only in the U.S.P., and is of 5 per cent. strength, being thus only half that of the Belgian formula, and one quarter of the strength of that given by Dr. Buchanan in the *British Medical Journal* (May 1, 1880). According to Stillé and Maisch (U.S. Disp., p. 173), iodide of starch contains "not over 7·5 per cent. of iodine," and the formula now given is, therefore, safer for internal use for those unusually susceptible to the action of iodine. A distinction is made in the U.S.P. between the Latin name for starch and that of amyl nitrite by making the word amyl indeclinable, and in the P.G. by adopting the form amylium.

ANGELICÆ, RADIX, P.G.—Although placed under "*Radix*" the description now begins with the words *Rhizoma breve.* As other rhizomes are placed under "*Rhizoma*," it is difficult to understand why this is placed under "*Radix.*" The measurement and description are now made more exact, by which the root of *A. sylvestris*, L., is excluded, being smaller than the dimensions given. For this reason, probably, it is not now alluded to. The directions to collect the drug in the spring of the second year of its growth, to reject specimens injured by insects, and to preserve it well dried in closed vessels, are now omitted.

ANISUM, U.S.P.; FRUCTUS ANISI VULGARIS, P.G.—In the last P.G. the fruit was described as about 2 millimetres long, which applies only to Russian anise. It is now directed to be 3 millimetres long and 3 broad, a description which admits only of the use of German and Maltese anise. The U.S.P. states that the fruit should be 4 millimetres long, which applies to the Alicant kind. It gives directions how to distinguish anise from conium fruit. As conium fruit rarely exceeds 3 millimetres in length, the official sort could not well be confounded with any but the Russian aniseed.

ANTHEMIS, U.S.P.—A description is now added by which the flower-heads may be distinguished from those of *Matricaria Chamomilla*, which was included in the secondary list of the last edition, and is retained probably in consequence of its preference by the German element of the population. The U.S.P. points out how the flower-heads may be distinguished from those of *A. arvensis* and *A. Cotula*, but the P.G., while mentioning neither these nor the two similar species, *Anthemis arvensis* and *Pyrethrum inodorum*, remarks that *M. Chamomilla* is distinguished from all the nearly allied plants by its hollow conical receptacle, the measurement of which it gives. (See "*Chamomillæ, Flores.*")

APOCYNUM, U.S.P.—This root is another remov from the secondary list and is now distinguished by the vernacular name of Canadian hemp, instead of Indian hemp as in the last edition, a precaution which will prevent confusion between this plant and *Cannabis indica.* It is undoubtedly a more active plant than *A. androsæmifolium*, which is no longer official, and, which moreover, is difficult to obtain in commerce in the United States, although easily procurable in Canada (*Amer. Journ. Pharm.*, [4], xi., 554.

ARNICA FLORES, U.S.P.; FLORES ARNICÆ, P.G.—The description in the P.G. now gives the measurement of the receptacle, of the fruit, and of the pappus, and a more full description of the flower, by which it may easily be distinguished from that of other Compositæ likely to be mixed with it. That given in the U.S.P. is not sufficiently definite to prevent admixture passing undetected. The P.G. directs the involucre and receptacle to be removed. The width of the receptacle "ad sex millimetros" is rather beyond that generally found in commercial samples, which are in most cases only 4 millimetres broad. The hairiness of the receptacle and the ten-veined ligulate florets, in conjunction with other characters, serve to distinguish it from *Inula britanica.* The description of the root in the U.S.P., in which it is said to be internally whitish, having "a rather thick bark, containing a circle of resin-cells surrounding the short woody wedges and large spongy pith," leaves it open to conjecture whether there is a second circle of resin-cells surrounding the pith. A more correct description would be:—The thin bark is brown internally and contains a circle of resin cells, the woody portion is whitish and consists of a single circular row of woody bundles surrounding a proportionately large greyish spongy pith." The rootlets are whitish internally, with a slender yellowish meditullium. The resin cells mentioned in the U.S.P. are not easily distinguished under an ordinary hand lens.

ASAFŒTIDA, U.S.P.; ASA FŒTIDA, P.G.—In both Pharmacopœias the names of the plants yielding it are changed to *Ferula Narthex* and *Ferula Scorodosma.* The U.S.P. states that 60 per cent. of the drug should be soluble in alcohol, and the P.G. directs that the ash should not exceed 10 per cent., that liquor sodæ should give a yellowish colour to it and that hydrochloric acid should not effervesce much nor become coloured when digested with it. Considering how frequently it is impure a strained preparation would be an improvement.

ASCLEPIAS, U.S.P.—This is one of the roots removed from the secondary list of the last edition. The reason for retaining *A. tuberosa* and discarding *A. syriaca* and *A. incarnata* is not very obvious, but is probably due to the properties of the former being better known and to popular prejudice in its favour. The vernacular synonym now adopted is "pleurisy root," instead of "butterfly weed," as in the last edition.

ASPIDIUM, U.S.P.; RHIZOMA FILICIS, P.G.—The name "aspidium" is now adopted in the U.S.P.

in preference to "*Filix mas*" and it includes also *A. marginale*, the rhizome of which is characterized by having six instead of about ten vascular bundles. The chaffy scales of the leaf-stalks and the dead portion of the rhizome and stipes are to be removed, the green portion only being used. In the P.G. the botanical name "*Aspidium*" is adopted instead of "*Polystichum*" as in the last edition, and the rhizome with the base of the leaves is to be collected towards the end of the year, the rootlets and "paleæ" being removed. The rhizome is not to be kept longer than a year and the transverse section of the leaf-bases should show a greenish colour, an angular outline and about eight vascular bundles, the number which appears to be most frequently present in *A. Filix-mas*.

Aurantii Amari Cortex, U.S.P.; Cortex Fructus Aurantii, P.G.—This is described in the U.S.P. as occurring either in thin bands or in quarters, the epidermis being of a dark brownish-green colour. The P.G. describes it as of a pale brown colour (subfusca), from which it would appear that it is not so carefully dried abroad as it is in this country. The Curaçoa kind rejected by the last edition is not now mentioned.

Aurantii Flores, U.S.P., are directed to be mixed with half their weight of chloride of sodium and preserved in a suitable jar in a cool place when it is desirable to keep them for some time.

Azedarach, U.S.P.—Removed from the secondary list. The description is apparently inaccurate in one part. In samples seen in this country the outer surface has not "blackish longitudinal *ridges*," but glossy patches of thin black epidermis more or less cracked and wrinkled.

(*To be continued.*)

THE SALT DEPOSITS OF DURHAM.*

People interested in the chemical trade in various parts of the United Kingdom will know that what may amount to a new departure in that very important industry has been taken on the north-east coast of England. About twenty years ago the late Mr. John Vaughan, of the firm of Messrs. Bolckow and Vaughan, the pioneers of the Cleveland iron trade, in boring for water at their Middlesbrough works, discovered an important bed of salt underlying their premises, close to the river Tees. A few years later Messrs. Bolckow and Vaughan converted their firm into a limited liability company, and shortly afterwards an attempt was made to win the salt by sinking a shaft. Unfortunately they met with insuperable obstacles in an abundant feeder of water, which caused them, after expending a very large sum of money, to abandon for the time their proposed salt pit, and for several years no further steps were taken in the matter. In the meantime the firm of Messrs. Bell Brothers (Limited), who had established iron works at Port Clarence, on the north bank of the Tees, opposite Middlesbrough, feeling that great inconvenience might arise to them if any one else were to become owners of the salt immediately adjoining their blast furnaces at Clarence, entered into negotiations with the owners of the minerals—the Crown and the Ecclesiastical Commissioners—for an extensive royalty, and began to consider in what way the salt could best be made available. The unfortunate experience of their neighbours Bolckow, Vaughan and Co., who had become large lessees of salt, partly from the Crown and partly from adjoining landowners, deterred Messrs. Bell Brothers from endeavouring to work the salt in the rock form, and induced them to seek some other method of winning the rich deposit. One of their partners, Mr. Thomas Bell, proposed a plan which was ultimately adopted. He suggested that a bore hole should be put down to the salt, that within this hole a tube should be inserted, and a pump placed at a proper depth, so that, availing themselves of the principle which governs the levels of liquids of different densities in tubes, it would only be necessary to pump the brine from such a depth as is represented by the difference between the specific gravity of water and fully-saturated brine.

On this suggestion being made to them Messrs. Bell Brothers proposed to inquire whether a similar plan had been carried out in any other region where salt is found, and speedily learned that in the eastern part of France, near the town of Nancy, a large bed of salt is so won, the only difference between the conditions of this deposit and that on the Tees being the much greater depth of the latter. They proceeded accordingly to sink a bore hole 16 inches in diameter to the salt, and for this purpose they availed themselves of the services of the Subaqueous Boring Company, who are the licensees of the well-known Beaumont boring machinery. Considerable difficulties of a practical character were met with in completing the bore hole, and it is impossible to award too great praise to the engineers of the boring company for the way in which they dealt with the various problems that arose. One instance was very interesting. It was found, for a variety of reasons, impossible to carry the hole down to its full depth, and the engineer of the company devised an instrument by which, after boring the hole 12 inches in diameter, he was able to bore it out to the full diameter of 16 inches, so that the lining tubes, which are essential to the carrying out of the plan, would follow the instrument to the bottom of the hole. The boring operations were begun on June 16, 1880, and completed on May 28, 1881. Simple pumping apparatus was then erected at the top of the bore hole, and on June 19, 1882 the first brine from the Middlesbrough salt pit was brought to the surface. It is peculiar that the salt is found at an entirely different geological horizon from that of the Cheshire beds, which occur at a much higher point in the strata than those at Middlesbrough. Although salt is a mineral of very wide distribution, it is chiefly found in the new red sandstone series. These rocks were probably deposited under conditions which caused the formation of large inland lakes, communicating, possibly, by narrow channels with the sea. It is surmised that those channels gradually became restricted, owing to the changes of levels, and the lakes thus formed full of salt water, by a process easily understood, in time became more and more concentrated. The Dead Sea is an instance of this geological change in our own time. No doubt the salt beds of Cheshire, as of Yorkshire, were formed in this way, the only difference between them being one of time, the Cheshire beds being created at a much later period than those of Yorkshire and Durham. It is interesting to note that the great German deposits are found at the same geological horizon as are the Middlesbrough beds.

Having won the brine on the banks of the Tees, the next question was how it should be utilized: The chief purpose for which salt is used in commerce is in the manufacture of alkali, and the main centres of this industry are Lancashire and the Tyne. The process at present in vogue in both these districts is known by the name of the great French chemist who invented it, Le Blanc, and is based upon the consideration that salt is decomposed by sulphuric acid to make sulphate of soda, which is subsequently treated so as to produce carbonate of soda. The most expensive and the most difficult part of this process consists in procuring sulphuric acid. This in olden days was got from native sulphur, but when the demand for this article became so great, a substitute had to be found, and pyrites or sulphide of iron was made to

* From the *Times*.

take its place. The immediate cause of chemical manufacturers seeking for another source of sulphur than the Sicilian mines was a great commercial blunder, committed by the Neapolitan Government some forty-five years ago. For a considerable sum of money they granted a monopoly for the export of the produce of the mines to a French company, who immediately used the power thus acquired to raise the price of sulphur to two or three times its former value. This continued for some little time until the British Government insisted upon the trade being relieved of such a burden. It was in operation, however, long enough to afford the soda makers of Great Britain an opportunity of finding a substitute in the mineral known as pyrites, which is a compound of sulphur and iron, from which the former element is easily separated as sulphurous acid by the heat evolved by its own combustion. Sulphur may be described as simply a vehicle to carry the metal sodium from the chloride with which it is found combined in common salt. The sulphate of soda obtained by the action of sulphuric acid on salt is subsequently decomposed; the sulphur becoming a waste product, by action of carbonate of lime and coal, when the soda, combining with the carbonic acid, affords the marketable article known as soda ash; pan and soda crystals are also produced. The sulphur, after having served its purpose, is all thrown away, and constitutes those unsightly heaps which are characteristic of alkali works all over the world. The salt required for the Le Blanc process must be in a solid form, and Messrs. Bell, looking to the Tyne as one of their chief markets, and believing by their favourable position that they can successfully compete with Cheshire, have erected pans to evaporate the brine and produce salt for the chemical manufacturers on the banks of the neighbouring river. The requirements of the Tyne amount to about 200,000 tons a year. It may be asked how it happens that an industry requiring so large an amount of material grew up at so great a distance from its source of supply. This is accounted for by the fact that at the time the Tyne became a great alkali producing place, small coals, which are largely used in the process, were exceedingly cheap. Indeed, the colliery owner was glad to have them taken off his hands, for it relieved him of the inconvenience of adding to the burning heap which was seen near every pit in the north, and the consumption of which subjected the coalowners to claims for damages from the neighbouring landholders. The changing circumstances of the coal trade, which have rendered small fuel a valuable article, have had a disastrous effect upon the soda trade of the Tyne. One establishment after another has been closed. While this has been going on, a new method of making soda has been introduced. Many years ago a plan was devised by Messrs. Heming and Dyar to take advantage of a well-known chemical reaction, by which, when a solution of common salt is mixed with bicarbonate of ammonia, decomposition takes place and bicarbonate of soda is precipitated. This reaction has been given a commercial value by Messrs. Solvay and Co., of Brussels, who are among the largest soda makers on the Continent, and, under licence from them, is employed by Messrs. Brunner, Mond and Co. (Limited), who have extensive works in Cheshire.

If the chemical trade of the Tyne is to be regarded to some extent as a dying industry the salt of the Tees must find another outlet. Salt as brine is requisite to the new process, and the alkali industry now located on the Tyne may have to migrate to the banks of the Tees, where it will find brine to its hand, or it will have to embark in an industry entirely different in character from that in which it is engaged at present. Probably it may be convenient that a half-way course should be adopted. A portion of the trade might remain where it is and continue to use salt in its solid form, drawing its supplies from Middlesbrough, and making either carbonate of soda as at present or sulphate of soda, which is extensively used in glass-making. This is likely to be so, as up to the present time no means has been discovered for obtaining chlorine cheaply by the ammonia process. This element is an active ingredient of the bleaching powder which is so largely used in many of our textile factories and mills. Chlorine is now procured from hydrochloric acid, produced by the action of sulphuric acid on salt in making sulphate of soda. It is that pungent destructive gas which renders the neighbourhood of chemical manufactories so distasteful to our senses of both sight and smell. The rest of the trade will, it may be predicted, migrate to the Tees, and, no doubt those who contemplate engaging in the salt industry will have to make arrangements for providing, not only the brine, but chemical works to absorb that product. We are able to state that Messrs. Bell Brothers, who are the pioneers in the salt trade of the Tees, which is of so much local and even national importance, intend to erect works near their salt pans for the manufacture of soda by the ammonia process. The royalty of salt held by Messrs. Bell Brothers extends over 2000 acres, half of which is from the Ecclesiastical Commissioners, and the other half from the Crown, the latter portion being situate under the bed and foreshore of the river.

The existing bore hole, which has attracted so much attention, is placed about the middle of the royalty held under the Ecclesiastical Commissioners, and is something like a mile distant from the banks of the Tees. The brine from the pumps runs in an underground conduit to a large reservoir, which holds about 500,000 gallons of brine, or, say, about 400 tons of salt. The reservoir, while serving as a place of storage in case of accident at the bore hole, collects any solid impurities which may have been carried into it by the water running through the pipes. By the aid of a pump the brine in the reservoir is delivered to the evaporating pans, which closely adjoin and are on a somewhat higher level. There are nine pans, all of which are of the form customary in Cheshire, each being about 65 feet long by 25 feet in width, and 18 inches in depth. Each pan is calculated to produce between 35 tons and 40 tons of salt per week. It will, therefore, be seen that Messrs. Bell Brothers (Limited) are already in a position to produce between 350 and 400 tons per week. Some very important experiments for utilizing the waste heat from the blast furnaces are being made by Messrs. Bell Brothers. They have erected experimental pans, and are producing over 20 tons of salt per week by using only the waste heat from the furnaces to accomplish the evaporation. The pans are so constructed that the number could easily be increased to twenty, which number would give a producing capacity of nearly 1000 tons per week. The salt from these works is being sent away by the North-Eastern Railway Company, whose lines immediately adjoin the pans, and close at hand is the river Tees, to which Messrs. Bell Brothers possess shipping access. The salt required for the chemical trade is somewhat coarse in the crystal, and is not usually employed for fish curing or ordinary culinary purposes. Should Messrs. Bell deem it advisable to embark in the manufacture of salt for other of its uses, they would require to make certain modifications in their present plant, but as long as the Tyne is in need of 4000 tons of salt per week, and while they are the only manufacturers on the Tees, it will not be necessary for them to look for any other market. The existing bore hole is sufficing for the present evaporating works, and they hope that, as the cavity formed by the solution of the salt obtained grows larger, they will get a greater quantity of brine from it. As the years of duration of such a bore hole are uncertain, they are about to put down another bore hole, and if the industry develops, as there is every reason to believe it will, they will put down a third and even a fourth hole. The site of the projected chemical works has been already determined upon, and is immediately adjoining the evaporating plant, where Messrs. Bell possess either as owners or

lessees a large extent of land, and are, therefore, in a position to increase the size of the works to any dimensions that may be required.

It is almost needless to say that the success of Messrs. Bell Brothers has aroused a great deal of interest in the north of England, and the chemical manufacturers of the Tyne are on the alert and anxious to learn the results over a few months. Already one of the largest alkali manufacturers there is contemplating becoming the lessee of a royalty on the banks of the Tees. Messrs. Bolckow, Vaughan and Co., too, the iron and steel manufacturers at Middlesbrough have decided to put down a bore hole to win salt in the same way as that adopted by Messrs. Bell Brothers. The only chemical works at present on the banks of the Tees are those belonging to Colonel Sadler, at whose extensive premises at Middlesbrough are produced alkalies, oxalic acid, various tar products, potash, and Epsom salts. These works, unlike those on the Tyne, are exceedingly busy, and afford employment to many hundreds of workmen. The landowners, as might be expected, are very much interested in the new industry. Quite recently in *The Times* attention was drawn to the disastrous effects on the surface of Cheshire produced by salt winning, and some speculation as to the future of low-lying lands in North Yorkshire and South Durham in the salt district may not be out of place. At Middlesbrough the salt lies more than 1000 feet below the surface and is at least 100 feet thick. There are about 200,000 tons to every acre, and many years, perhaps even generations, may elapse before the salt works of the Tees produce any considerable effect. There can, however, be no doubt that ultimately an enormous cavity will be formed underneath Middlesbrough and its environs. Possibly this cavity will not occasion such disasters as have taken place in Cheshire, where the salt lies much nearer the surface. It is believed that at Middlesbrough the superincumbent rocks will, in falling, pack themselves into the spaces left by the salt much less closely than that mineral, and possibly there may be a very slight subsidence on the surface. Whenever the surface subsides, the landowners will profit by their predecessors in Cheshire and make the best they can of the circumstances. We have said enough to show that there is opening out for the Tees an industry which, though it may not vie with that great iron trade which has grown to such gigantic proportions on its banks in so short a time, will, nevertheless, prove of enormous value in the development of that commercial centre. Probably nowhere in England are there to be found men more likely to take advantage of any circumstances which present themselves for the enlarging of the trade of Cleveland, or more able to cope with a new industry, than those who within a generation have created an iron trade which for extent and importance is not to be equalled in the United Kingdom.

BEE CULTURE IN INDIA.*

The following information respecting the bee industry in India, is gathered partly from the *Indian Agriculturist.* The details were obtained by Mr. John Douglas, Superintendent of Telegraphs, from Mr. Morgan, Deputy Conservator of Forests, and are noteworthy from the light they throw on the modes of collecting wild honey. The best honey-producing flower of Southern India is the strobilanthes, which not only forms the principal undergrowth of the *sholas*, both temperate and tropical, but spreads over the grassy slopes of the higher elevations. There are an immense number of species in this genus and they almost all flower once in seven years, dying down entirely, and afterwards a fresh growth springing up from seed. Whenever any species of strobilanthes flowers, colonies of bees migrate from all parts of the country to feast on the honey, and rear their young broods. At such times honey becomes plentiful and cheap, and as the strobilanthes honey is of the finest quality and flavour, even rivalling that from the famous Mount Hymettus, it is eagerly sought after by the Todas of the Neilgherry Hills, and in fact by all aboriginal tribes. The year 1879 was such a season for honey that it sold at the rate of 4 annas per imperial pint, whereas its usual price is from 8 to 10 annas. This honey, in the cold climate of the Neilgherries, crystallizes in from a fortnight to three weeks, when the flavour becomes richer and finer. In the Wynaad, as soon as the moon has waned sufficiently, great preparations are made to take the honey. Bamboo and rattan ladders are constructed, sometimes of astonishing length, and at nightfall, after 9 p.m.—for the bees do not go to bed till then, as you will find to your cost if you disturb them—the Jain (honey) Kurumbars proceed to the *burray*, and, having erected their ladders, if they have to climb upwards, or suspended their cane ladders, if downwards, arm themselves with torches and knives and sever the combs from the rock or branch. The drowsy bees meanwhile, roused by the glare of the torches, desert the combs, and buzz aimlessly about, even on the persons of those engaged in taking the combs, but never attempt to sting, unless crushed, or hurt. The combs are then lowered down in baskets, the Kurumbars feasting on the larvæ, which taste something like cream, while the fish, which swarm in thousands when the hives are built over a river, have a glorious feed on the grubs and bees that fall into the water and float helplessly down stream.

The Coorgs make some attempts at bee culture and practise the industry to a small extent in their own homes; the bees are domesticated, and the hives, which are of a very primitive description, made merely of the hollowed out trunks of trees, are placed near the houses. The Coorgs have, however, no notion of collecting the surplus honey by any of the contrivances, such as bell-glasses, supers, etc., in use in England in the different apiaries.

In Cuddapah wild honey is collected also from the cliffs and ravines of the district. The process adopted is both perilous and exciting, and the Yanadies alone are able to climb into the difficult and apparently inaccessible places over perpendicular cliffs, in some places from 100 to 200 feet in height. They do this by the aid of a plaited rope, made of young bamboos tied together. This rope sometimes gives way, the result being a terrible accident. It is a very nervous sight to watch the men climbing up these frail supports, and it reminds one of the egg-collecting process in northern latitudes. The men, from below, look like little babies hanging midway, the rope being fastened on the top of the cliff above, by means of a peg driven into the ground, or to the trunk of a tree, the man swinging midway with 100 feet or so above and below him, and armed with a stick and a leather basket. The Yanady first burns some grass or brushwood under the hive, by which the bees are driven out; he then swings the rope until it brings him close to the hive, which he pokes with his stick, holding out his basket at the same time to catch the detached portions of comb. When the basket is full, he shakes the rope, at which signal his comrades above draw him up. The bamboo ropes are left to hang, often for years, until they rot away, for a rope of this kind is never used twice, a fresh one being made on each occasion and at each place.

South Canara is also a great honey district. The honey and wax have, however, but little local value, a maund, about 25 lbs., only fetching R2 and R16. It is thought that much might be done to open up the industry by exporting the honey and wax to England, the latter being a valuable product and one for which there is always a demand. The trade at present in Indian honey is almost entirely confined to wild honey; but as the keeping of bees is an industry requiring little or no capital, it is especially adapted to the people of India.

* From the *Times*.

Should the returns obtained from the inquiries now made and set on foot by Mr. Douglas show that it is worth while to introduce this industry in a practical form, then Mr. Buck—the whole subject having been placed under his department—may possibly see his way to making a decided effort to interest the people in systematic bee culture with a view to the trade in honey and wax becoming ultimately a profitable one to the country.

ANTISEPTIC PROPERTIES OF CARBONIC ACID.*

BY PROFESSOR H. KOLBE.

Since 1874, when the author published his first experiments on the antiseptic action of salicylic acid, it has been his constant endeavour to find out a suitable method of its employment for preserving meat. Innumerable experiments, repeated under varied conditions, have convinced him that although meat impregnated with carbonic acid is, in fact, protected from decay, it acquires an unpleasant flavour after a few days, and when boiled or roasted it disseminates a disagreeable (but not putrid) odour. In spots where any decomposition was noticed, the meat no longer reacted acid, but alkaline.

This experience led to the conjecture that meat could be protected from spoiling by the acids in general, as well as by their gases, if it is thereby protected from the liberation of ammonia which accompanies decomposition, in the same manner as by putting it in vinegar.

The first experiment in this direction, made by putting a piece of beef on a plate under a glass bell jar of carbonic acid, was unsatisfactory. Before the end of the week, a putrid odour was perceptible, and the parts in contact with the plate, where no carbonic acid could reach them, showed an alkaline reaction.

The results were better when the meat was suspended so as to hang freely in a vessel filled with carbonic acid.

The experiment was repeated in apparatus of various sizes. The meat to be preserved was hung on a tinned iron hook that moved along a horizontal iron rod in a cylinder made of sheet tin. On the bottom of the cylinder was a porcelain dish to catch the dropping liquid from the meat, and in the side of the cylinder, just above the dish, a tubulus was soldered on air tight, and through it passed a short glass tube connected with a rubber tube for introducing the carbonic acid gas. The rubber tube could be closed quickly and tightly by means of a pinchcock. The cylinder also had a gutter around the top, into which the lid fitted, and which was half full of glycerine. A tubulus was also soldered into the top of the metallic cover, and provided with a glass tube like the lower one.

The glycerine acted like a water seal, and when the vessel was closed, carbonic acid from a Kipp's constant apparatus was passed in by the lower tubulus and expelled the air through the upper one, which was left open. When nearly all the air may be supposed to have been displaced by carbonic acid, the two rubber tubes are securely clamped.

The first series of experiments were made in winter, the second in the hot months of summer. The cylinder containing the meat stood in the warmest room of my laboratory, which, being on the south side, was exposed to the sun's rays for the greater part of the day, and at noon the temperature rose to 32° C. (90° F.). Pieces of freshly killed beef weighing from 2 to 5 kilos (4½ to 11 lb.), including bone and fat, were used.

A week after the beef had been put in the cylinder of carbonic acid, it could not be distinguished by appearance, colour, or odour from fresh meat. It reacted slightly but distinctly acid everywhere.

After being carefully washed off it was boiled in water. The broth made from it smelled and tasted just like that from fresh meat, and the meat itself, if not boiled too long, was soft and tender, not stringy.

Meat suspended in carbonic acid for two weeks had the same qualities as the other, except that it looked greyer, but within it was red and juicy. The broth made from it, as well as the meat itself, had a pleasant flavour, and only a very sensitive palate could distinguish a slight difference in the taste of this broth and that from fresh meat. In a few cases the meat as well as the soup had a slightly acid taste, which was completely removed by putting in a very small quantity of carbonate of potash. Meat kept in carbonic acid for three weeks was as good as that left there for two weeks, but was softer than fresh meat, and required less time to cook it, or to obtain good broth.

After being kept in carbonic acid for four or five weeks, the meat was still free from putrid smells, but the broth made from it did not taste as good as fresh *bouillon*. The experiments were not continued any longer.

From this it will be seen that *carbonic acid is an excellent preservative for beef*, which will retain its flavour in it for several weeks.

It is worthy of note that mutton acts quite differently, and after being kept in carbonic acid gas for a week it begins to have a putrid smell.

Veal does not keep as long as beef. No experiments have been made with game or fowls.

Fish, oysters and fruit only keep a short time.

This property of carbonic acid to preserve beef a long time will scarcely become of any great practical importance, but may find use where carbonic acid is given out in abundance from the earth. At the Nauheim baths there are dry wells in which almost unlimited quantities of carbonic acid stream forth and are pumped out to be used for making soda water, and for other purposes. It would be worth while to try how long beef could be kept fresh by hanging it on a rope in such a well.

The experiments described give rise to many other queries, such as whether light has any effect on the preservative power of carbonic acid.

The author does not propose to extend his experiments any further, and leaves the field free for others who wish to study the chemical and physiological changes and reactions.

* From the *Chemiker Zeitung*. Reprinted from the *Scientific American*.

NEGRO COFFEE.*

The following extract from a letter from Dr. Nicholls, of Dominica, shows that the use of the seeds of *Cassia occidentalis* as a coffee substitute is well known amongst the negro inhabitants of that island:—

"*Cassia occidentalis* is, I find, an excellent coffee substitute; it is called in Dominica by the following names, 'l'herbe puante,' 'café marron,' and 'wild coffee.' I have often heard of the negroes using the seeds of a native plant as coffee, but it is only lately that I have inquired into the subject. I collected some seeds and directed my cook to roast and grind them, so that I might taste the 'coffee.' Other matters engaging my attention I forgot the circumstance until several days afterwards, when one evening my wife inquired how I liked my after-dinner cup of coffee. I turned to her inquiringly, when she laughingly said, 'that is your wild coffee.' I was indeed surprised, for the coffee was undistinguishable from that made of the best Arabian beans, and we in Dominica are celebrated for our good coffee. Afterwards some of the seeds roasted and ground were brought to me, and the aroma was equal to that of the coffee ordinarily used in the island.

"The plant itself is used by the native 'doctors' medicinally in the form of a decoction, and it has the reputation of being a good diaphoretic. The weed is very common, so if it turns out to be valuable it can be obtained in large quantities."

* From the 'Report on the Royal Gardens at Kew.'

The Pharmaceutical Journal.

SATURDAY, JANUARY 13, 1883.

Communications for the Editorial department of the Journal, books for review, etc. should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE MISUSE OF POISONS IN INDIA.

THE annual report of the work done in the Department of the Chemical Examiner to the Indian Government in Calcutta, a copy of which has been placed at our disposal by Dr. WARDEN, contains a considerable amount of information respecting the use and abuse of poisons in India. That country has long had an unfavourable reputation in respect to the use of poisons for criminal purposes, and the department was originally established in order to prevent irresponsible persons from interfering in toxicological investigations. The need for such a department is evidenced by the fact that out of 1900 analyses performed during the year, no less than 1157 were in connection with medico-legal cases. The number of human viscera examined was 225 and poison was detected in 93 cases. Opium and arsenic were the poisons most frequently found and aconite was detected in a few cases. Cattle-poisoning also seems to be on the increase, but for this purpose arsenic is the poison most used, and, indeed, it is the only one that was detected during the year. It is known, however, that other poisons are employed by the natives for the purpose, though at present they have not been sufficiently investigated to allow of their detection with certainty.

Besides the analyses in connection with cases where the death of men or animals was supposed to have resulted from poisoning, 652 suspected articles of food were examined and more than half of them were found to contain poison, the poisons most frequently occurring being arsenic, opium, datura, aconite and copper. Enormous quantities of arsenic were sometimes found in the parcels of suspected cattle poison sent for examination; in one case as much as one pound of white arsenic was found in two packets. Further, in consequence of the existence of rumours to the effect that the spirits manufactured in the country were sophisticated with nux vomica, datura, etc., a large number of samples were examined, but no poisonous vegetable adulterant was in any case detected.

The use of poison for criminal purposes has naturally commanded the attention of the Indian Government for some time past, and the advisability of imposing restrictions has been discussed. Three years ago the chemical examiner recommended that some restriction should be placed on the sale of strychnine on the grounds of its strong resemblance to santonin, and because these substances, which are largely used throughout the country, are sometimes mistaken for one another. As, however, not more than four deaths from strychnine were reported in 1878–79, and five in the following year, and only four of the nine were due to it being mistaken for santonin, the Lieutenant-Governor was of opinion that the number of accidents was too small to justify any such restriction as that proposed. It was, however, directed that a recommendation should be made to the medical store-keeper to colour strychnine with a view to the prevention of such mistakes. Last year the attention of the Lieutenant-Governor was again turned to the subject, as the improper use of strychnine, aconite, morphia, and mercury was becoming more common, whilst the returns of cases of poisoning by arsenic remained constant. After consideration, however, a similar conclusion was arrived at, that it was not desirable at that time to lay down stringent regulations for the sale of poisons, or to define the class of persons who should be permitted to sell poisonous drugs. In the present report Dr. WARDEN has once more referred to the subject, and suggests that if it be impracticable to restrict the sale of all poisons, the indiscriminate vending of arsenic at least might be diminished by levying on it a prohibitory tax which would place it beyond the reach of the masses.

Another description of valuable work done in the department has been the examination of potable waters, and in this report, together with a table showing results of analyses, Dr. WARDEN gives a short and interesting account of the quality of some of the kinds of Indian waters which he has analysed. Dr. WARDEN also draws attention to the prevailing neglect of simple precautions against the pollution of tanks, and makes some useful suggestions as to the best method of insuring the purity of the water contained in them. The report further refers to the work done by Dr. WARDEN in the chemical examination of indigenous drugs with a view to their substitution for imported drugs, some of the results of which have already been reported in this Journal. Amongst other things, reference is made to a solution of daturine, intended for ophthalmic purposes, which it is stated could be prepared on the large scale at about one shilling a pint. This solution has been submitted for medical trial, and although it is not considered strong enough and has been found occasionally to cause pain and irritation, it is spoken of as a very useful remedy which in certain cases of eye disease might be employed instead of atropine, with the advantage that it is far less costly. It may be hoped that, notwithstanding the multifarious labours which fall to this department, some time will be found to continue the work of chemical investigation in so promising a field as the native plants of India.

PHARMACY IN THE FRENCH ACADEMIES.

A VISITOR to the new School of Pharmacy in Paris will readily perceive that French pharmacists are by no means disposed to forget the past history of their art. Good reason have they indeed to be proud of the parts played in the world of science by their predecessors, and M. LEFORT needs no justification for taking the opportunity afforded by a recent meeting of the Paris Pharmaceutical Society to call attention specially to the extent to which pharmacy has been represented in the scientific academies of France.

The first Academy of Sciences in France was founded in the year 1666, by LOUIS XIV., at the instigation of his famous finance minister, COLBERT. It was intended to be devoted to practical science rather than to the reading of papers, and with this object laboratories were maintained at the royal expense at the place of meeting, in which experiments and observations were made and the results obtained were discussed by the members in common. Animal and vegetable products, minerals, and especially mineral waters, were submitted to such analysis as was then possible, and it was only natural that after a few years pharmacists should be called to take part in the work. The first pharmacist admitted into the Academy of Sciences, in 1686, was MOSES CHARRAS, the author of a 'Pharmacopée galénique et chimique,' and next, in 1699, came NICOLAS LÉMERY, the author of the 'Cours de Chimie." Then followed BOULDUC, GEOFFROY, ROUELLE and CADET DE GASSICOURT. But the revolutionary wave that swept away men did not spare institutions, and a few months before LAVOISIER was sent to the guillotine the academies in France were suppressed as useless. In 1795, however, the Convention established a new "Institut des Sciences et des Arts," which included all the academies as they now exist. In the new Academy of Sciences, as in the old, pharmacists have taken an honourable place, as will be seen from the following roll of names:—BAYEN, the two PELLETIERS, VAUQUELIN, PARMENTIER, BAUMÉ, DEYEUX, PROUST, SERULLAS, ROBIQUET, LESSON, GAUDICHAUD, BALARD, BUSSY, GERHARDT, LECOQ, PLANCHON, BERTHELOT, CHATIN, GIRARDIN, and MILNE-EDWARDS. Each of these men was a legally qualified pharmacist; but there have been others also who commenced their scientific career in a pharmacy, among whom may be mentioned, DUMAS, FRÉMY, and TRECUL.

The Academy of Medicine was founded in the year 1820, by a decree of LOUIS XVIII., and one of its duties was to be to reply to questions of the Government on all subjects affecting the public health, and particularly in respect to new and secret remedies, and natural and artificial mineral waters. Originally the Academy was divided into three sections, medicine, surgery and pharmacy, and the first nine nominations to the pharmacy section were —BOULLAY, DEYEUX, FABRE, HENRI, LAUGIER, PELLETIER, PLANCHE, ROBIQUET and VAUQUELIN. Amongst the earlier elections by the Academy itself were—BOUDET, DEROME, CAVENTOU, GUIBOURT, LABARRAQUE, BUSSY, CHEVALLIER, DEROSNE, FRÉMY and SERULLAS. Since the year 1829 the Academy of Medicine has been divided into sections, of which that devoted to pharmacy is the eleventh, but pharmacists frequently figure in other sections. The list, given by M. LEFORT, of eminent pharmacists who have been connected with this Academy as members, associates or correspondents, is too long for quotation here, and this is the less necessary since it includes many names that have already been mentioned. At present there is only the one class of members, limited to one hundred, and amongst them are included many whose names have frequently appeared at the head of articles published in these pages.

THE RELATIONS BETWEEN MEDICINE AND PHARMACY.

A CORRESPONDENT writing to the *British Medical Journal* last week sketches some clauses regulating the relations between medicine and pharmacy which he submits should be inserted in the proposed new Medical Bill. The first clause suggested would be a restriction upon medical practitioners, prohibiting them from supplying or dispensing medicines between 8 a.m. and 9 p.m., except in cases of emergency, if a pharmaceutical chemist were resident within half a mile or a mile. The second would most affect prescribers and patients, since it would provide that a prescription should not be dispensed more than once, unless ordered to the contrary, until it has been redated and resigned by a medical practitioner. The next would be restrictive upon chemists and patent medicine proprietors, for it would impose stringent regulations to prevent counter prescribing, prohibit the recommendation of proprietary preparations and patent medicines, and provide that the only statements on the wrappers and labels of patent medicines should be as to the ingredients and proportions of which they are composed, without any reference to their medical uses or effects. Although in the presence of actual facts these suggestions as a whole must certainly be looked upon as impracticable and chimerical, there is running through them a healthy recognition of the necessity for a more distinct separation of medicine and pharmacy, which is welcome. The writer also goes on to say that in consideration of the increased business which non-dispensing by medical men would give to pharmacists they would probably be induced to charge less for dispensing prescriptions, and be satisfied with 25 to 50 per cent. profit on the retail price of the drugs used. Although the charges for medicines are not likely ever to be regulated in this crude fashion, we think this question may be left to right itself, for pharmacy is not yet such a close preserve as to be free from the competition which in all other businesses influences so largely the rates of charge.

The Seventeenth Chemists' Ball, held at Willis's Rooms on Wednesday last, was attended by upwards of three hundred persons. The chair was taken by Mr. R. B. Warrick, who in proposing the single toast of "Success to the Chemists' Ball" referred to the increasing favour shown towards these annual gatherings, which he was well able to illustrate from his own experience as one of the earliest promoters of them. Great praise is due to the Honorary Secretary, Mr. J. F. Savory, for the admirable way in which the arrangements were carried out and the success of the Ball thus secured.

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The new edition of the United States Pharmacopœia is to be the subject of a communication which will be brought before the North British Branch of the Pharmaceutical Society, by Mr. William Gilmour, at the Evening Meeting on Wednesday next. A "Note on Pungent Tincture of Iodine" is also to be read at the same meeting by Mr. P. MacEwan.

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The Twelfth Annual Soirée of the Midland Counties Chemists' Association is to be held on Monday, the 22nd inst., in the Town Hall, Birmingham. Mr. Stokes Dewson is the Honorary Secretary.

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The Second Junior Pharmacy Ball is to take place at Willis's Rooms, on Wednesday the 24th inst. This year the Ball is under the patronage of Mr. Michael Carteighe, and Mr. W. H. Kerr is the Honorary Secretary.

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On another page will be found a paper on "Genius, Talent and Industry, and their Relation to Pharmaceutical Research," which Mr. R. W. Giles read before the School of Pharmacy Students' Association last week. The Association may be considered fortunate in receiving at the opening of a new session the stimulus of two papers relating to pharmaceutical research from such eminent men as Mr. Holmes and Mr. Giles, but it may be hoped that the potential investigators in the Association will not conceive the idea that because the reference to pharmaceutical research *per se* by the authors is somewhat limited the field is a small one.

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At the meeting of the School of Pharmacy Students' Association on Thursday next, a "Note on the Detection of Strontium" is to be read by Mr. F. Ransom; and Mr. W. Elborne, as Reporter on Materia Medica, will read a report upon "New Remedies."

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On Thursday, also, the Chemical Society holds its next meeting, when a paper will be read on "A New Method of Estimating the Halogens in Volatile Organic Compounds," by R. P. Plimpton, Ph.D., and E. E. Graves.

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With a view to collecting professional opinion as to the communicability of phthisis the Collective Investigation Committee of the British Medical Association has had enclosed in each copy of the *British Medical Journal* for last week a form, with a request that it should be torn out by the medical man receiving it and returned with a statement whether he has ever observed any case in which pulmonary phthisis appeared to be communicated from one person to another and other particulars.

* * * *

Commenting upon the medical treatment of M. Gambetta last week, the *Lancet* refers to the likelihood that the very means employed for his recovery retarded the object in view. Being a prominent man it was thought desirable to multiply the number of physicians and surgeons and to enjoin absolute rest, whilst if he had been a more obscure person, he would have been out in the garden in a week with his arm in a sling. The constipation resulting from the rest in bed is considered not improbably to have been the determining cause of the inflammation, but the *Lancet* thinks it "strange that amongst so many eminent members of the profession in attendance there was no one able to detect the irreparable mischief going on."

* * * *

According to some statistics recently presented by M. Pasteur to the French Academy, the mortality from charbon among eighty thousand vaccinated sheep in the department of Eure-et-Loire, where the average mortality of the previous ten years had been 9·01 per cent., fell last year to 0·65 per cent.

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The number of visitors to Kew Gardens during the year just completed is announced to have been 1,244,167, or 407,491 in excess of the number in 1881 as recently quoted in these columns.

* * * *

According to a statistical abstract of failures in the United Kingdom during the year 1882, which has appeared in *Kemp's Mercantile Gazette*, the total number of chemists and druggists who failed last year was 87, whilst in 1881 it was 168. There was also a falling off in the number of bills of sale registered from 351 in 1881 to 223 in 1882. The entire number of failures in Great Britain last year was 10,707, and in the previous year, 11,632.

* * * *

A correspondent in the Isle of Wight has forwarded us a cutting from the *Hampshire Independent*, in reference to the recent case of poisoning by chloral, from which it appears that the implied reflection upon the chemists who supplied the chloral hydrate syrup, conveyed by the remark of a juror at the inquest, had not any foundation in fact. We are informed that the bottle was duly labelled "poison," but that the purchaser afterwards removed this label. We are glad to be enabled to point out this fact, as showing that proper attention is paid to the provisions of the law, at least by those upon whom rests the responsible duty of supplying poisons to the public.

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An engraving of the medal recently presented to M. Dumas to celebrate the completion of the fiftieth anniversary of his election to the Academy of Sciences is given in *Nature* for the 4th inst. On the obverse is figured the head of the recipient, with the inscription, 'J. B. A. DUMAS SECRETAIRE PERPETUEL DE L'ACADEMIE DES SCIENCES." On the reverse are the words: "A. J. B. A. DUMAS: SES CONFRERES: SES ELEVES: SES AMIS: SES ADMIRATEURS: 1832–1882.

* * * *

Professor Bunsen, of Heidelberg, has been elected a Foreign Associate of the French Academy of Sciences, to fill the place rendered vacant by the death of the late Professor Wohler.

Pharmaceutical Society of Ireland.

MEETING OF THE COUNCIL.

The monthly meeting of the Council of this Society was held on Wednesday, January 3, at the College of Physicians, Kildare Street, Dublin, at 3 o'clock.

The President, Professor Charles Tichborne, in the chair.

The other members of the Council present were Messrs. Allen, Bennett, Brunker, Dr. Collins, Messrs. Doran, Draper, Grindley, Hayes, Hodgson, McIlwaine, Dr. Montgomery, Messrs. Payne, Pring, Simpson, Wells, and Dr. Whitaker.

Mr. Fennell, the Registrar, read a letter from Dr. John William Moore, stating that in his opinion it would be advisable for the Council to eliminate from the curriculum of the Society's Preliminary examination the subjects of chemistry and botany. His experience as an examiner of the Society for the past three years had led him to think that those subjects ought to be relegated to the final examination, first, because candidates were always fully examined in them; secondly, because the subjects could only be studied usefully in a practical manner; thirdly, because his experience of the answering at the Preliminary examination convinced him that the candidate in almost every instance learned off by heart as much of the text-books as would enable him to obtain a passing mark; and fourthly, because such a mode of study was, in his opinion, worse than useless and calculated to create a dislike in the mind of the student to the subsequent practical study of those sciences. He thought a thorough testing of the students in English, Latin, arithmetic, and weights and measures, would better fulfil the purposes of the Preliminary examination.

Mr. Brunker said the Council could not at present take such a step as that suggested. It would involve the rescinding of bye-laws.

Mr. Draper dissented from the recommendation of the letter. The sooner a student began to endeavour to acquire a knowledge of such important subjects as chemistry and botany the better. If he had merely learned by rote the examiner would see that. The argument that the student got a dislike to the subjects should not weigh for a moment.

Dr. Collins: In what other way can the student learn botany and chemistry at first save by rote?

Dr. Whitaker said no doubt they should attach some weight to Dr. Moore's letter, but in almost all the public schools botany and chemistry were now taught; botany certainly was. There was not one of his children who did not know the difference between the stamen and the pistil of a plant, and in fact the rest of the rudiments of botany, although they were all very young. The great thing was to instil the first principles as soon as possible. He therefore thought the examiners would exercise a wiser discretion in recommending even book knowledge of the elements of those sciences. His experience was quite the reverse of that of Dr. Moore.

The President said it was on his recommendation that botany and chemistry were introduced into the Preliminary examination; and he confessed he did not see anything in Dr. Moore's letter to induce him to change his opinion as regarded the desirability of including the rudiments of these subjects. They were introduced into the Preliminary examination in order that it might lead to their being taught in public schools. The Pharmaceutical Society was the first licensing body that took the step in question, and he thought it was a move in the right direction. No doubt it would lead to other licensing bodies adopting the same course. At the same time their examiners were aware that they did not think these sciences should be made an important point at the Preliminary examinations as the candidates were afterwards examined more fully.

Mr. Draper said that next to mathematics there was no better subject for training the mind than chemistry.

Mr. Grindley: Does Dr. Moore get sufficient time?

The President: There is no restriction in that respect. He can have as long as he likes.

Mr. Brunker said he believed the knowledge of botany possessed even by those who came up for the licence was very often little better than book cram.

The President maintained that it was a good basis of knowledge for the student to have a knowledge of the contents of two text-books on chemistry and botany.

Dr. Montgomery: At what period are we to commence instilling a knowledge of chemistry and botany if not at the Preliminary examination? If we were to remove those subjects from the Preliminary examination they might be totally neglected.

Mr. Payne said the candidate for the Preliminary examination must be sixteen years of age and he should know the rudiments of the sciences in question before that.

Mr. Draper: If he does not he will never know them.

Dr. Collins remarked that several members of the Royal Medical Commission were of opinion that botany and chemistry should be in the Preliminary examination, but that there should be only the one examination.

Mr. Brunker moved—

"That the Council do not see any practical disadvantage arising from the including of the rudiments of botany and chemistry in the Preliminary examition."

Mr. Bennett seconded the resolution, which was carried, *nem. con.*

The President: A letter should accompany the resolution to Dr. Moore in order to explain the views of the Council.

A letter was received from Mr. John P. Middleton, enclosing a declaration which he desired the Council to accept, instead of the usual certificate, as evidence of a competent knowledge of compounding. It stated that on June 1, 1877, he became the apprentice of Messrs. Brooks and Grindley, who were then partners, and served for five years, during which period he performed the usual duties of an apprentice to a pharmaceutical chemist, making most of the preparations in the Pharmacopœia. On October 10, 1882, the partnership was dissolved and Mr. Brooks ceased to practise as a pharmacist. Before Mr. Grindley left, he (Mr. Middleton) applied to him for a certificate, but he declined to give it on the ground that it would be rejected by the Council. Mr. Middleton stated that he believed Mr. Grindley gave a certificate to Mr. George Lane McCormack, in 1881, and also that the Council accepted a declaration from a Mr. Boyd, who was in a similar position to that which he occupied. He (Mr. Middleton) passed the Preliminary examination in October, 1879.

The President said the most desirable course would be to refer the application to the Certificate Committee.

Dr. Whitaker was of a similar opinion.

Mr. Hodgson, Mr. Allen and Mr. Brunker thought it would be better to discuss the matter now.

Mr. Grindley said he gave the certificate to Mr. McCormack before the new regulation relegating such matters to a certificate committee was adopted. He understood at the time that any such certificate given afterwards would not be accepted by the Council. He had no personal feeling whatever against Mr. Middleton.

Dr. Montgomery: If he served five years we have no authority to ask the gentleman whom he served. Was his time fully occupied in compounding?

The President (To Mr. Grindley): Was there any difference between the position of Mr. McCormack, to whom you gave the certificate, and that of this gentleman, as regards pharmacy?

Mr. Grindley: No, certainly not.

Dr. Whitaker moved—

"That the application be referred to the Certificate Committee, with a request to report upon it to the next meeting of the Council."

Mr. McIlwaine seconded the resolution.

Mr. Brunker remarked that the other gentleman mentioned by Mr. Middleton, namely, Mr. Boyd, worked with a gentleman who died; and that was why he could not get a certificate.

Mr. Grindley: I am prepared to give Mr. Middleton a certificate to-morrow, and then let him come with it to the Council.

The motion of Dr. Whitaker was put and carried.

A letter was read from Mr. James H. Haslett, of Belfast, asking whether candidates who passed their Preliminary examination on November 1, 1882, would come under the resolution requiring all candidates for the Final examination to have served four years.

As the answer to this letter depended upon the course taken with respect to subsequent resolutions, it was merely marked "Read."

A letter, dated December 1, 1882, was read from Dr. Kaye, Q.C., Secretary to the Privy Council, enclosing the resolution of the Council of November 1, in the form as amended by the law officers of the Crown. The original resolution was in the following terms:—

"That all candidates for the licence be required to produce a certificate signed by a pharmaceutical chemist or apothecary keeping open shop, stating that he has served a *bonâ fide* engagement with him as either apprentice or assistant in his sole employment for a term of four years. To come into force on January 1, 1884."

The resolution as amended was as follows:—

"That every candidate for the licence shall be required to produce a certificate signed by a pharmaceutical chemist or apothecary keeping open shop, stating that such candidate has served a *bonâ fide* engagement as apprentice or assistant with and in the sole employment of such pharmaceutical chemist or apothecary, or the firm of which he is a member, for a term of four years. To come into force on January 1, 1884."

Mr. Payne withdrew a resolution of which he had given notice on the subject, on his attention being called by the President to the fact that it differed only verbally with one of which Mr. Allen had given notice.

Mr. Allen moved—

"That every candidate for the licence who has not passed the Preliminary examination previous to January 3, 1883, shall be required to produce a certificate signed by a pharmaceutical chemist or apothecary keeping open shop, stating that such candidate has served a *bonâ fide* engagement for a term of four years as apprentice or assistant, with, and in the sole employment of, such pharmaceutical chemist or apothecary, or of a firm of legally qualified pharmaceutical chemists or apothecaries, of which aforesaid pharmaceutical chemist or apothecary is a member."

His object was to avoid the great injustice which would be done to candidates who had passed their Preliminary examination under the supposition that they had only two years to serve if the resolution prescribing the new term were brought into operation at an earlier date than January 3.

Mr. Pring seconded the motion.

Mr. Doran: Suppose a candidate is accidentally prevented from finishing the four years?

The President: If his employer died he would have to commence again.

Dr. Whitaker: That is not what is intended. The resolution is very well worded in other respects; but you might add a proviso to meet the case of death, or other exceptional cases.

Mr. Draper said it would be idle for him to repeat the views which he had already expressed on this subject, and which were absolutely unaltered. He saw no reason whatever for converting the period of two years prescribed in the 'Calendar,' at page 56, into what was virtually an apprenticeship for four years. He thought the step a retrogressive one. He was unable to see what was to be gained by four years instead of two. He moved by way of amendment—

"That the regulation as regards practical pharmacy remain as at present stated at page 56 of the 'Calendar.'"

Mr. Pring: I do not think that can be received as an amendment to the motion. The principle of having a period of four years has already passed the Privy Council.

The President said he was not an advocate for reopening the question, but the remark last made did not come with good taste from a Belfast member, who came and reversed a decision previously arrived at by the Council. He (the President) told them at the time that they were making a very bad precedent. The resolution under consideration had been merely sent back for amendment by the Privy Council; it was not yet sanctioned by that body. He would appeal to Mr. Draper to recognize in any amendment that he proposed the views arrived at by the majority of the Council.

Mr. Hodgson said he had great pleasure in seconding Mr. Draper's amendment. He had the strongest possible objection to altering the regulation contained in the 'Calendar.' It was quite understood at the time of the formation of the Pharmaceutical Society that the principle of apprenticeship was abolished, and that the period of service was to be two years, spent in practical pharmacy, the qualifications of the candidate to be afterwards ascertained by an examiner in pharmacy.

Mr. Draper said it was quite evident that the law officers of the Crown had not a very strong opinion as to the value of the Preliminary examination.

Mr. Brunker moved—

"That the resolution be amended by the insertion after the words 'Preliminary examination' of the following words:—'Of this Society, or such examination as is accepted as equivalent to same.'"

Dr. Whitaker seconded the amendment.

Mr. Payne said he entirely approved of making the resolution take effect from the 3rd of January in this year, and he had very much pleasure in supporting the motion.

Dr. Whitaker remarked that there was now no reopening of the question. It was settled. Mr. Pring and himself were the earliest reformers in pharmaceutical matters; and they were satisfied that no amount of teaching by lectures or otherwise could give the practical knowledge that a pharmacist should have. Five years' service from the age of sixteen was a very small hardship, and a young man could not be a pharmacist until after he was twenty-one. They only wished to uphold the honour and prestige of the Society and make it not second to the sister Society in England. He knew that it was very easy to fluke examinations, and that the best examiners were sometimes deceived.

The President: Does Mr. Draper press his amendment?

Mr. Draper said if he had the faintest chance of carrying it he would. He felt very strongly on the subject of the attempt to substitute an apprenticeship for the examination test. He held that the examination standard was far too low; and that a young man should not be withdrawn from study to an enforced apprenticeship of four years. The English Society had not yet found it advantageous to substitute four years for two.

The President: He is right. No apprenticeship is required.

Mr. Draper: Not the drudgery of an apprenticeship.

The President said it had been stated two or three times there that the Pharmaceutical Society of England insisted on a three years' apprenticeship. He had made inquiries and had found that that was not so. The test they used was employment for a given time in pharmacy.

Mr. Payne: For three years.

Dr. Montgomery was of opinion that the only way a young man could learn his business was behind the counter of a respectable pharmacist. If they wanted him to know his business, he should be kept to it.

The President put the amendment of Mr. Draper, which was negatived on the suggestion of the President.

Mr. Brunker moved another amendment in the following terms:—

"Such term may be made up of shorter terms, amounting in all to four years, in the sole employment of a duly qualified pharmaceutical chemist or apothecary keeping open shop."

Mr. Doran seconded the amendment.

The President said that in his opinion it would be better that the date from which the resolution was to take effect should be January, 1884. A great many young men had made their arrangements for this year, and it would not be fair to take them short.

Mr. Brunker maintained that if the arrangement was for the benefit of the members of the Society, the sooner it came into operation the better. The Council were not under obligations to any young man outside the Society until he had passed the Preliminary examination.

The President: You are, to a certain extent, making it retrospective if you do not give every young man who is apprenticed an opportunity of coming up for his Preliminary. I propose that the date be altered to January 3, 1884.

Mr. Draper said he had much pleasure in seconding the amendment of the President.

The amendment on being put was negatived.

The two amendments of Mr. Brunker were agreed to; and the motion, as amended by them, was then put and carried.

The following new members were elected:—Mr. Joseph Edmondson, Peafield, Blackrock; Mr. John McMurray, M.D., M.Ch., Warrenpoint; Mr. John James Gamble, Balieborough.

A report was received from the Examiners, stating that the following gentlemen had passed the examination for the licence as pharmaceutical chemist held on that day:—Mr. James Finlay, Nairview; Mr. William James Hunter, Castleblaney; Mr. William Pratt, Belfast; Mr. James North Hardy, Dublin; and Mr. Henry Forewell, Dublin.

On the motion of Mr. Payne the Examiners' report was adopted.

A report from the Law Committee was considered and adopted.

Mr. Hodgson observed that the expense of prosecutions was a very serious item, and, unless the members of the Society subscribed to recroup them, he did not see how they could be carried on.

The President thought the advisability might be considered of sending out a circular to the members of the Society, informing them that a considerable amount of illegal compounding was going on, and that funds were required in order to enable the Council to carry out prosecutions to stop it.

Some formal business having been isposed of, the Council adjourned.

Proceedings of Scientific Societies.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of this Association was held on Thursday, Jan. 4, Mr. H. G. Greenish, Vice-President, in the chair.

Mr. R. W. Giles read the following paper upon—

Genius, Talent and Industry, and their Relation to Pharmaceutical Research.

BY RICHARD W. GILES.

The words "genius" and "talent" denote qualities which differ not in degree but in kind; yet are they often used as though they expressed the same thing. This confusion of thought is not only to be met with in the deliberations of inferior institutions, such as social science congresses and legislative assemblies; it has even, once at least, intruded itself (doubtless by a slip of the tongue rather than by misconception of the brain) into the more classic sphere of this Association; and as this happened to be upon the last occasion of our meeting, to hear Mr. Holmes's paper upon 'Pharmaceutical Research,' it seems opportune in point of time to treat of it this evening, and fitting in point of method to consider it in connection with a third quality, viz., industry, and the relation of the three to pharmaceutical research.

In the first place let us see whether the dictionaries throw any light upon the true meaning of the words "genius" and "talent." For as to the word "industry" we all know the meaning of that. Happy are we if we "also practise what we know." Dr. Johnson in 1784, defined "genius" as—"1. The protecting or ruling power of men, places or things. 2. A man endowed with superior faculties. 3. The mental power or faculties. 4. A disposition of nature by which any one is qualified for some peculiar employment. 5. Nature or disposition."

I would have you notice that a hundred years ago the premier meaning assigned to the word "genius" was personal—a *divinity*, or a highly endowed *man*. It appears to have been only secondarily used to denote the *qualities* with which men are endowed. It will be interesting to observe how this order had become reversed seventy-five years later, and how "genius" in the sense of a divinity or a demon had become speciated from genius in the sense of a quality of the mind.

Thus Webster in 1858 defines "genius" (which he derives from γεννάω to beget, to produce, to create) as—

"1. The peculiar structure of mind which is given by nature to an individual, or that disposition or bent of mind which is peculiar to every man and which qualifies him for a particular study or course of life, as a genius for history, for poetry, for painting. 2. Strength of mind, uncommon powers of intellect, particularly the power of invention. In this sense we say 'Homer was a man of genius' and hence: 3. A man endowed with uncommon vigour of mind; a man of superior intellectual faculties, thus, 'Shakspeare was a rare genius.'"

Then follows:—

"Genius, pl. Genii, a spirit or demon; a tutelary deity."

"Genius loci, the presiding divinity of a place; hence the pervading spirit of a place or institution."

In this sense we might speak of the "genius loci" of this school; and having called him up for our convenience, we will wish him a happy new year and dismiss him to rejoin the company of the infernal gods; for we can scarcely suppose that the presiding genius of the laboratory is permitted to pollute with his odours the Asphodel meadows of the celestials.

We may venture to ignore our venerable friend Dr. Johnson, who contributes nothing to our knowledge of the matter in hand beyond the means of instituting the comparison already adverted to between the past and present meaning of the word, always an interesting point in philological inquiry, and we will proceed to extract what we can out of Webster.

First, then, Webster directs us to that most important element in ascertaining the true meaning of words, its derivation, which he ascribes to the Greek verb γεννάω to beget. It may be open to doubt whether "genius" is related to its root in its active sense as a thing which begets or creates, or in its passive sense as a thing begotten or created. I think the first is the most natural and most likely relation, and it agrees with that signification of the word "genius" for which I mean to contend, viz., that it is essentially a quality which creates, or as Webster put it, "particularly the power of invention." This is its distinctive characteristic, by which it differs from talent or cleverness, from industry or perseverance,

almost from humanity, and approaches the divine; for, strictly speaking, creative power is the attribute of God alone, and it is only by some elasticity of language that we can say of "genius" that it creates. "There is nothing new under the sun," said the wise man of old, and even a new idea or new invention is but the grasping of some suggestion too subtle to be perceived by minds of ordinary mould.

The next thing to be noted in Webster's definition is the quality of *speciality*. Every illustration is characterized by the adjectives "peculiar," or "particular," or "uncommon."

Again, it is worthy of remark that the two examples of illustrious genius cited by Webster are respectively the greatest *poet* of antiquity and the greatest *poet* of modern times—Homer and Shakspeare. I need not remind you that our word "poet" (ποιητής of the Greeks) is derived from the Greek word ποιέω to make, and its primitive signification is "one who makes—a creator;" nor need I tell you that poetry has always been held to be the highest manifestation of the imaginative or creative faculty; but I may fairly deduce from the similar source of the word "genius" (from γεννάω) a similarity of meaning; and I do claim, on the ground of derivation and analogy, that genius always implies a special creative faculty, which is totally different from any amount of cleverness which may be properly designated as talent. The genius possesses another characteristic in common with the poet. It may be said of both with equal truth, "Nascitur non fit." In fact we may make use of our familiarity with the character and quality of the poet to rectify our conception of the word "genius," and we shall have a pretty good idea of its right meaning if we say that the poetical faculty is but one phase of a variety of faculties which are comprehended in the generic term "genius."

Webster suggests another thought when he says "Shakspere was a *rare* genius,"—genius is always *rare*. Nature cannot afford to be prodigal of geniuses; and it would be ill for the world and its everyday duties and necessities if she were. The speciality of genius has an obvious tendency to unfit its possessor for careers which may be open to him, and which offer better opportunities of personal advantage and even greater happiness than the strait and narrow path which he is compelled to tread by an impulse more powerful than self-interest. For it by no means follows that genius is a blessing to the possessor; it is often eccentric, Bohemian, not always moral; its domestic relations are not seldom infelicitous. As the fondest of mothers said of poor, crabbed, splenetic, unhappy Carlyle, "he was gay ill to live wi'." Shakspeare, whether the deer-stealing scandal be apocryphal or not, was certainly not conventional in other respects, and his marriage was an ill-assorted one. Goethe, who was undoubtedly a genius, a poet and something more than a poet, lived a life which set social laws at defiance, and blighted the happiness of many pure-minded women, at last marrying one who was in every way unworthy of his reputation, and not to be compared with those whose pure affection he had won and basely deserted. But at least he bore his degradation philosophically, and has left to the world the following recipe for securing domestic peace under matrimonial difficulties:—

> "Use the woman tenderly, tenderly;
> From a crooked rib God made her slenderly;
> Straight and strong he could not make her,
> So if you try to bend you'll break her;
> But let her alone and have her own way,
> She'll grow more crooked every day;
> What's to be done with her, Adam, my boy?
> Use her tenderly, that's what I say,
> To break your own rib will bring you small joy."

It seems as if the genius which soars above the level of common humanity in intellectual exaltation could not brook the restraint of those social laws and conventionalities to which ordinary men yield a willing obedience, and hence those frequent eccentricities which have given rise to the line "Genius is to madness much allied."

Genius is a mighty trust given to one man for the good of all mankind; it is not a light which may be or which can be hidden under a bushel. No wonder then that genius is rare; and you, my friends, if you do not happen to possess this rare gift, be not discouraged, but bear your easier lot with Christian fortitude.

It will not be inappropriate at this place to read to you an extract from the address given by Mr. Ince at the beginning of the session, and which I hope you have not yet forgotten and will not soon forget. The speaker made a short and as it were parenthetical allusion to genius, and I claim his remarks as being altogether in harmony with the foregoing observations. He said:—"We read of genius—and in truth there is a species of divine intuition vouchsafed to a few. A street boy takes a piece of chalk and with it traces lines which command the admiration of the world; a rude miner in the bowels of the earth solves problems in mathematics; and an untaught lad makes music out of pots and pans—music destined to be the delight of after ages. For this there is no law—but next to genius there is something which marvellously simulates its effects, and that is uninterrupted perseverance. So great is its power that some have even mistaken its identity and declared that genius itself was but the faculty of unremitted application." Carlyle, whom I just now inadvertently grouped as a genius, which is by no means my real opinion, made this mistake when he said that "genius was only an infinite capacity for taking trouble," a faculty which he possessed to an extraordinary degree, but he could hardly have found more appropriate words to express what genius is *not*.

Parents sometimes unwisely complain that their boys show no inclination for any particular vocation in life, and will not assist them in the choice of a profession. It is because they have not that *peculiar bent of mind qualifying them for a particular course of life*, which is Webster's definition of genius. But they have what is better for the world at large and for their fathers in particular. They have (if they are good for anything) the *adaptability*, which is alien to genius, but which enables them to turn their hands and apply their minds to anything that comes in their way, and to fill with credit "that station in life to which it has pleased God to call them," with greater or less success, according to the talent with which they are endowed. It is rare that in their early years boys have a pronounced preference for any one pursuit. If they have they are dangerous, and likely to turn out sham geniuses (such counterfeits being more common than the genuine article) and to become a perplexity and trouble and ultimate disappointment to their friends. But if there be real genius, it may be safely left to work out its own deliverance, for it will not be controlled; it will "out," as sure as murder. I have known two instances of mechanical genius forcing its way through obstacles, in my own circle of acquaintance. The first was the son of a prosperous merchant who had every prudent reason for wishing his boy to succeed him, but it was hopeless; and the father at last reluctantly took him to a firm of engineers, where he introduced him thus, "Here is my boy; he *will* be an engineer, and I can't stop him." The boy justified his obstinacy by great success. Amongst other things he invented the oscillating steam engine. The other had similar tastes to which his friends would *not* yield. They apprenticed him twice or more to different trades, from which he always ran away at the end of about a fortnight, and after a time, I forget by what chance, he became a farmer, and pursued his mechanical hobby in the horse pond. There he matured the construction of the screw propeller, which revolutionized marine locomotion.

But for one such as these there are a dozen make-believes who, having neither genius, talent, nor industry, have a

plentiful and impartial dislike to all kinds of honest work, for whom I recommend the fag end of Solomon's proverb, "A whip for the horse, a bridle for the ass and a rod for the fool's back."

Before passing from "genius" to "talent" I must make one observation which has the appearance of ungallantry, but is really not incompatible with the profoundest respect and admiration for the not inferior though dissimilar qualities of the gentler sex. It is an undeniable fact that "genius" in its highest manifestations has never been attained to by a woman. At first sight it may seem strange that the imaginative faculty, which seems to be closely allied to that emotional susceptibility which is undoubtedly most pronounced in women, has not developed a female *poet* of the highest order, though the sex are by no means deficient in facility of versification; still more remarkable that there has been no single example of a woman attaining to eminence as a musical composer. The fact is singularly at variance with the sentiment which has delighted to personify the Muses as a divine sisterhood, but it is a fact notwithstanding. If I may hazard an explanation I would suggest that the creative faculty which we call "genius," being the nearest approach which human intellect can make to divine intelligence, can only be produced by the highest development of the highest nature. We recognize something like this idea by the accepted phrase a "masculine intellect," which has become an accepted phrase because that which itdenotes is common to men and exceptional in women, and that which is general in the one sex and exceptional in the other will naturally find its highest development in the first. But we do not mean to say that "genius" has no degrees, or that it is only to be found in such illustrious types as Shakspeare and his peers, if, indeed, he has any peers. It would not be easy to draw the line between "genius" and "talent," though we adhere to the dictum in our first sentence that the difference *is in* kind and not in degree. Certainly we do not mean to deny the possession of genius, and genius of a high order, to such remarkable women as the late Mrs. Cross (better known by her significantly selected *nom de plume* of George Eliot). As Mrs. Lewes she is understood to have been greatly indebted to Mr. George Henry Lewes for advice and assistance in the authorship of her best works. He probably had more learning, wider experience, more of all that can be acquired by study: but she had the *genius*, which no amount of study can give and no amount of teaching can convey.

And now we will deal much more briefly with talent, again having recourse to our dictionaries as a starting point.

Johnson here favours us with a derivation, which he says is from the Latin "talentum," a weight. This reminds one of the City gent, who said that "the word 'omnibus' was derived from the French 'omnibus,' signifying a public conveyance to accommodate twelve inside."

Johnson further defines "talent" thus—

"1. A talent signified so much weight, or a sum of money, the value differing according to the different ages and countries.

"2. Faculty, power, gift of nature. A metaphor borrowed from the talents in the holy writ. It is used sometimes seriously and sometimes lightly.

"3. Quality, disposition. An improper and mistaken use."

Webster, adverting to an earlier source, derives talent from the Greek ταλάω to bear, and adds that it originally signified a balance.

He says further that it was—

"1. A weight and denomination of money amongst the ancient Greeks, also amongst the Hebrews.

"2. Faculty, natural gift or endowment. A metaphorical use of the word derived from the parable of the talents."

There is not much to be got out of either of these definitions. They do not enter into philosophical or philological analyses; but one thing is in marked contrast with the definitions of genius previously quoted. There is here a total absence of reference to "speciality," "peculiarity," "particularity," "rarity," or even to "superiority." Nor is there any hint of a connection with inventive, imaginative, or creative powers.

For all that the dictionaries say "talent" may be (and no doubt *is* in greater or less degree) the common gift of all mankind. Here then we have a good broad distinction, which should suffice to prevent the two words "genius" and "talent" from being used synonymously or as though the difference between them was only one of degree. Let us follow out the thought and see if we cannot discover some other differences which will still further distinguish the two words and point to their relation with the quality of industry.

"Talent" is a quality which enables its possessor to acquire knowledge by learning from others and by unassisted study.

"Genius" on the other hand is characterized by a great independence of instruction: it takes its own course and originates new ideas and inventions never thought of before. It may of course enlarge its sphere of knowledge by reading, by observation, and by experiment; but it is by no means characteristic of genius to be apt to be taught; on the contrary embryo geniuses are often dull fellows at school and idle to boot. It rather dislikes to follow in the track of others, and rises superior to obstacles of circumstances and deficiencies of education. Genius may safely be left to hew a path for itself. Talent is greedy of instruction. Hence the two have very different relations to education, a subject upon which I should much like to dilate, but the length into which I have been unintentionally betrayed warns me to avoid the temptation.

Arkwright perfected his invention of the spinning frame in the uncongenial atmosphere of a barber's shop, in the teeth of a scolding wife who more than once broke up his models on the eve of completion, and who habitually upbraided him for neglecting the profitable occupation of "an easy shave for a penny," with the elegant apostrophe "Cuss the cheenery." I believe she lived to to be Lady Arkwright. Let us hope that she learnt to moderate the rancour of her tongue.

George Stephenson, inventor of the locomotive and the father of railways, developed his extraordinary engineering genius in the obscurity, physical and metaphorical, of a coal pit; eking out his slender earnings by mending the boots of his fellow workmen and occasionally a watch or clock.

Sir Humphrey Davy, who was described as an "idle and incorrigible schoolboy" was apprenticed to an obscure apothecary at Penzance; he afterwards became assistant in the laboratory of Dr. Beddoes, of the Hotwells, Bristol, well known to my father, who was then serving his apprenticeship at the same place, but I cannot discover that he knew anything of the doctor's more illustrious subordinate.

Faraday's father was a Yorkshire blacksmith, who migrated to London, presumably in search of work, and Faraday himself was apprenticed to a bookbinder. A chance attendance upon four lectures by Sir Humphrey Davy was the immediate cause of his directing his attention to science, and he was some time after introduced to the Laboratory of the Royal Institution through Davy's instrumentality.

Benjamin Franklin made his first entry into Philadelphia, a poor lad with all his possessions upon his back and a dollar in his pocket. As Mark Twain depreciatingly remarks "Anybody might have done that; the only difficulty is to have the dollar." But how few out of the millions who have begun life with a dollar or even with less, have arrived to be Franklins!

On the other hand it seems absolutely immaterial with

what seemingly insuperable disadvantages genius may be oppressed; it *will* make its way to the surface and triumph over all.

Can industry then supply the place of genius? Emphatically, No! Industry may compensate for paucity of talent; for talent, as we have said, is a common heritage, and its presence or absence is a matter of degree, and whatever results are attributed to talent are the joint product of talent multiplied by industry.

Thus if T = talent and I = industry the following equation will correctly represent the results accomplished by two persons whose talent and whose industry differ in inverse ratios:—

$$T \times 10I = 10T \times I = 10TI.$$

If, therefore, any of you is conscious of an excess of talent,—say = 10 T,—let him glory in his good fortune, and in the assurance of the great results he may attain by multiplying his gift by a similarly high power of industry. For $10T \times 10I = 100TI$!!

If, on the other hand, there is anyone here who diffidently estimates his talent at something below par, let him not be disheartened; he has but to increase his industry and the results cannot fail to be respectable. Thus the zealous servants in the parable improved the talents committed to their charge, whether many or few, and received their reward; while he who hid his solitary talent in a napkin was visited with his lord's displeasure—not because it was but *one*, but because he slothfully neglected to turn that one to good account.

As for genius—whether you have it or not is no concern of mine—nor need it concern anyone, yourself included. It may safely be left to follow its bent, and to assert itself in due time; when the time has come it will ride you whither you know not, as remorselessly as ever witch rode to her Sabbath on a broomstick. In the meantime, and until it declares itself, it will be safer to assume that you have it not.

And now, just a few words upon the relation of these three qualities, genius, talent and industry, to pharmaceutical research. There can be no question of the absolute necessity of industry in order to acquire the knowledge upon which the higher qualities must work. There is as little doubt of the great advantage of talent, both to facilitate the acquisition of knowledge and to apply it judiciously under new circumstances from which discovery must be sought. Is there any room for genius? Yes! there is room, and much need for that inventive originality which is the chief characteristic of genius and which enables one man to read indications which are meaningless to another; but it will scarcely soar so high within the limited domain of pharmacy as to win the laurel crown of genius.

If in the prosecution of pharmaceutical research you or your contemporaries should be led to discoveries so striking as to merit that distinction, it is to be expected that they will belong to and be claimed by a wider field of science than pharmacy embraces; but pharmacy will look on and applaud your success and take an honest pride in the source from which it sprung.

In conclusion, I will try to illustrate in a somewhat allegorical form the respective characteristics of genius, talent and industry.

"Genius" is as a living organism, instinct with its own life, performing its appointed functions spontaneously, as of necessity.

"Talent" is an elaborate engine, skilfully devised to move many wheels and to perform divers works, but wanting the motive power.

"Industry" is the motive power.

A discussion followed the reading of the paper, in which the Chairman, Secretary, Messrs. Alcock, Elworthy, Howard and Parker took part.

A hearty vote of thanks was passed to Mr. Giles for his interesting paper.

Mr. R. J. MacDermott then read some notes on "Practical Photography." The paper was illustrated by experiments and apparatus.

A discussion followed in which the Chairman, Secretary, Messrs. Alcock, Elworthy, Giles and Parker took part.

A vote of thanks was passed to Mr. MacDermott for the trouble he had taken in bringing the subject before the Association.

The meeting then adjourned.

CHEMISTS' ASSISTANTS' ASSOCIATION.

Subnitrate of Bismuth.*

BY F. HARRIS ALCOCK.

(*Concluded from page* 539.)

PHYSICAL AND CHEMICAL CHARACTERS.

U.S.P. (1872).—A heavy white powder of a somewhat satiny appearance. Faintly acid odour and taste, and when moistened with litmus paper a decidedly acid reaction. Entirely soluble without effervescence in nitric acid, and the solution yields no precipitate with dilute sulphuric acid. Upon being heated to redness it loses 20 per cent. of its weight. When mixed with dilute sulphuric acid in excess, and subjected to Marsh's test, it yields no arsenic, or merely a trace. But in 1882 the following description is given:—"A heavy white powder, permanent in the air, odourless and almost tasteless, showing a slightly acid reaction, when moistened, on litmus paper, and insoluble in water or alcohol. When heated to redness the salt gives off moisture, and afterwards nitrous vapours, leaving a yellow residue which is soluble in nitric or in hydrochloric acid, and is blackened by hydrosulphuric acid. On dissolving 1 part of the salt in 5 parts of warm nitric acid (specific gravity 1·200) no effervescence should occur (absence of carbonate) and no residue should be left (absence of insoluble foreign salts). The reactions, for purity, of this solution, as well as those of the original salt, should be the same as those mentioned under "bismuthi carbonas." [These may be added, and consist of the following:—Solution in HNO_3, as above, poured into 50 parts of water, a white precipitate is produced, and on filtering and concentrating the filtrate to 6 parts, a portion of this, mixed with five times its volume of diluted sulphuric acid, should not become cloudy (absence of lead). If another portion be precipitated with an excess of water of ammonia, the supernatant liquid should not exhibit a blue tint (copper). On diluting a third portion with 5 volumes of distilled water, the filtrate should not be affected by test solution of nitrate of silver (chloride), or of nitrate of barium (sulphate); nor by hydrochloric acid (silver). If the salt be boiled with acetic acid diluted with an equal volume of water and the cold filtrate freed from bismuth by hydrosulphuric acid, the new filtrate should leave no fixed residue on evaporation (alkalies and alkaline earths). On boiling 1 gram of the salt with 10 c.c. of solution of soda (specific gravity 1·260) and holding a glass rod dipped in acetic acid over the test-tube, not more than a faint white cloud, but no heavy white fumes should appear (only traces of ammonia). If the preceding mixture after thorough boiling be diluted with water to 50 c.c. and filtered, the filtrate, when supersaturated with hydrochloric acid and treated with hydrosulphuric acid should not deposit more than a trace of a precipitate, which should not have a yellow or orange colour (only traces of antimony, arsenic and tin). On boiling 1 gram of the salt with 10 c.c. of strong solution of soda, decanting the liquid from

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* Read at a Meeting of the Association, November 8, 1882.

the precipitated oxide of bismuth into a long test-tube, and adding about 0·5 gram of aluminium wire cut into small pieces (a loose plug of cotton being pushed a short distance down the tube), the generated gas should not impart any colour or tint to paper wet with test solution of nitrate of silver and kept over the mouth of the test-tube for half an hour (absence of more than traces of arsenic)]."

Codex.—Of a fine pearl-white appearance; when pure, not affected by the light, but is soon coloured when it comes in contact with certain organic substances. To be preserved from all sulphurous vapours, which colour it brown.

German (1882).—A white powder, crystalline under microscope, of an acid reaction. At 120° C. 100 parts lose from 3 to 5 parts of water; and when heated stronger red vapours are emitted, and from 100 parts 79 to 82 parts of bismuth oxide are obtained. Half a gram dissolved in 25 c.c. diluted sulphuric acid (1 of acid in 6, and specific gravity 1·110 to 1·114) does not evolve carbonic acid, and remains clear. Some of this solution mixed with solution of ammonic hydrate in excess, when filtered is without colour, and when sulphuretted hydrogen water is added does not give any reaction (coloration). Another part diluted with a little more than an equal volume of distilled water, produces at once a precipitate when sulphuretted hydrogen is passed through, and if the precipitate be removed by filtration the clear supernatant liquid on evaporation should leave no residue. Subnitrate of bismuth dissolves in nitric acid with production of a clear liquid, which solution is neither rendered turbid by solution of nitrate of silver (17·0 grams to 1 litre) nor by solution of nitrate of barium (1 in 50). When warmed with an excess of solution of caustic soda, bismuth subnitrate evolves no odour of ammonia, and the clear liquid filtered, and placed in a test-tube with a few small pieces of bright iron wire and a small quantity of zinc filings, and heated; the gas evolved does not stain within an hour a piece of paper moistened with solution of nitrate of silver (1 in 2).

German (1872).—"Very white, crystalline powder; moistened with water turns blue litmus paper red; with nitric or hydrochloric acid a clear solution is formed without effervescence; a nitric acid solution diluted with a little water does not give turbidity with nitrate of silver, nor with dilute sulphuric acid. A solution obtained by boiling with ten times its weight of dilute acetic acid and precipitated by sulphuretted hydrogen and filtered does not on evaporation leave any residue. Solution of potash added in excess does not, when warmed, cause evolution of ammonia, and this solution diluted and filtered from insoluble residue is not rendered turbid by sulphuretted hydrogen. To see if free from arsenious acid heat with an equal quantity of sulphuric acid until nitric fumes cease to come off; mix with six times its weight of water and place in hydrogen apparatus, arresting sulphur compounds by means of cotton wool saturated with solution of acetate of lead placed as usual and holding over mouth of exit tube a piece of white filter paper, moistened with solution of nitrate of silver. To be preserved in well-closed bottles."

The appearance of bismuth subnitrate both ordinarily and microscopically varies very much. It is easily examined by means of the microscope, using a moderate power ($\frac{4}{10}$ inch). The crystals are generally small, prismatic, uniform, colourless, transparent, but may be acicular, triclinic, hexagonal, octagonal, and apparently in double oblique rhombic prisms, terminated by several planes. Pereira's description would not pass a sample which might answer U.S. tests in Pharmacopœia of 1880 and even 1882, for he says it is a dull white *inodorous, tasteless,* pulveriform substance, which with a magnifying lens is seen to consist of very fine silky acicular crystals. This appearance depends on mode of production, for if precipitated from very acid solution with little water the crystals are acicular and of a silky lustre. Clammy varieties of a dark grey colour may be looked upon with suspicion.

The formula for this substance, like its crystalline form, has been variously stated. Chemists have not agreed upon whether it shall be—

$BiNO_4.H_2O$; $BiONO_3,H_2O$; $4BiONO_3.BiH_3O_3.3H_2O$; $5BiONO_3.BiH_3O_3 3H_2O$; $3BiONO_3.BiH_3O_3.3H_2O$; $3BiONO_3.2BiH_3O_3.H_2O$: $Bi_2O_3.N_2O_5 2H_2O$; $Bi'''(NO_3)_3Bi_2O_3.3H_2O$, or $BiO(NO_3)_2(HO)_2$.

"It is difficult to prove whether or not the water in the subnitrate or hydrous oxynitrate of bismuth is an integral part of the salt (*vide infra* Gladstone's method). If it is the compound is simply the hydrato-nitrate ($BiNO_3 2HO$) of bismuth" (Attfield). One thing is certain and it is that commercial samples do not contain as much Bi_2O_3 as theory would require (being 79·28–82·37). Suppose $BiONO_3 2H_2O$ (molecular weight = 306) to be the true formula, then we should require 100 parts to yield of Bi_2O_3, 76·477; N_2O_5, 17·64; water, 5·88 (see also Gladstone 'Chem. Mem.,' vol. iii.). Mr. Edwards in 1850 called attention to the variable amount of water present in this compound, his figures being:—

	Per cent.					
Bi_2O_3 . .	77·23	79·4	87·46	87·1	73·4	80·08
N_2O_5 . .	16·2	13·8	2·32	10·0	16·38	18·5
H_2O . .	6·0	6·6	10·1	1·6	9·5	1·3
	99·43	99·8	99·88	99·7	99·28	99·88

Again Pereira mentions five more authorities as under:

	Herberger.	Duflos.	Grouvelle.	Phillips.	Menigaud (at 212° F.).
Bi_2O_3 . .	79·70	80·00	81·37	81·92	85·33
N_2O_5 . .	14·44	13·58	13·97	18·36	14·67
H_2O . .	5·86	6·42	4·66	0·00*	0·00*
	100	100	100	100·68	100

To these may be added—

Gmelin.	Gladstone.
80·67	79·23
16·41	18·49
2·92	3·22 (mean of four experiments).
100·00*	100·94

Phillips and Menigaud supposed that all H_2O was removed by drying at 212° F., but Gmelin by repeated experiments showed that H_2O enters into the constitution of the compound. Gladstone's method consisted in ignition of the compound and determination of the water by passing the aqueous vapour, first over ignited metallic copper and then into a tube containing $CaCl_2$. Nitrogen was estimated by the absolute method used in organic analysis, and Bi as oxide by ignition of the salt in a platinum crucible.

It is sparingly soluble in water; decomposed by alkalies as in B.P. process for production of Bi_2O_3. Ammonia dissolves it to a small degree, due perhaps to formation of Bi_2O_3 and nitrate of ammonium which would retain some in solution. As above stated by gentle heat it becomes Bi_2O_3. It may be formed by heating ternitrate at 300° F. for several hours (Gladstone). With stannous chloride it assumes an orange-yellow colour which after some days, or immediately on boiling, changes first to brown and then to black. By repeated boiling with water it is said that all the acid can be removed and Bi_2O_3 alone will remain, but another writer says 1 per cent. HNO_3 is always left behind. The speedy effect of H_2S on this compound may be beautifully shown thus:—Take a book of one hundred pages, such as those in which silver leaf has been kept, and on the first page paint with a brush characters with this bismuth preparation and on last page put a little alkaline sulphide, the vapour of latter coming into contact with the bismuth by passing through the pores of the

* After drying on water-bath and placing under desiccator for some weeks.

paper produces a deep brown colour (brun foncé). M. Monge proved that air carries the vapour of the sulphide, since he found that on collecting the leaves one by one no coloration had taken place on them. Iodide of potassium in weak and *faintly* acid solution lets fall a brick-red precipitate of iodide of bismuth, and on this Thresh has endeavoured to form a quantitative method for estimation of alkaloids. With regard to the acidity of this preparation it is a question whether it ought to be very acid; the U.S. and German Pharmacopœias allow of a little, but some time ago a specimen was examined which was very acid, and on reference to such works as B.P., Professor Attfield's 'Manual,' Pereira's 'Materia Medica' (Bentley and Redwood), Macnamara's 'Neligan's Medicines,' Royle, Garrod, Griffiths, Scoresby Jackson, no direct mention is made of this. Phillips, however, on the authority of Martindale says "that it is sometimes so acid as to effervesce with carbonates," and Ekin in *Pharm. Journ.*, [3], iii., 381 says, "that manufacturers have told him that after some months it becomes acid." Roscoe, too, says "it has acid reaction." The B.P. preparation of the lozenge probably means that it should not be acid, for carbonates are there mixed with it. It would be interesting to know if the lozenges do alter in composition after keeping. Prepared exactly according to the B.P. when fresh it does not redden blue litmus when cold water is used to moisten it with, but when warmed, acid is soon liberated, and quickly reddens the test-paper. There is another point which leads one to suppose that it should not be acid, and that is its use as a dusting powder and cosmetic; it would be unsuited for this purpose if very acid, and would in all probability do more harm than good in such cases as it is then used for; and, as has been said before, Pereira states that it is *inodorous* and *tasteless*, which is an indirect inference that free acid should be absent. Also Professor Gubler says it is a reliable *antacid*. It blackens the fæces of patients who take it. Here it may be mentioned that patients have sometimes complained that bismuth blackens the tongue and an explanation by Mr. Hamilton was mentioned in "The Month" of *Pharm. Journ.* (February, 1880–81), who said that it is probably due to the reduction of finely divided metallic bismuth upon the tongue by the sugar formed in the saliva after eating starchy matters. He found that the saliva, taken after fasting several hours and added to a heated alkaline solution of bismuth, caused no blackening, but that after eating bread and then adding the saliva to the bismuth solution, a blackening of the mixture readily occurred. In the case of a lady who had been taking bismuth for some months, she was suddenly alarmed one morning by finding that her mouth and tongue were quite black and came at once to ask her chemist the reason. It was found that she usually preceded her bismuth dose by one of Friedrichshall water which (as this did) sometimes contains sulphide of calcium, which is due to the action of organic matter on the sulphate of calcium present in this water, and hence had resulted in the production of black sulphide of bismuth.

IMPURITIES.

Very soon after this preparation became known to the world it was looked upon as a very uncertain and unsatisfactory one, because being extensively used, and closely allied to compounds of other metals it laid itself open to adulteration. On its acceptance by the medical faculty of the various colleges as a drug worthy of a place in their official pharmacopœias a test was subjoined which should indicate it to be free from lead, etc. Even now it is found impure, accidentally often, and intentionally much less frequently.

There are four sources of accidental impurity, viz., firstly, that arising from the metal itself; secondly, from the nitric acid; thirdly, washing water, and lastly manipulation. With regard to the metal, the method by which it is obtained, its source and geological associations, and firmness with which it sticks to its friends whose acquaintance it made at its source, would lead us to expect that we should find them many and formidable. We will not enter into the question of how these may be removed, but it will be well perhaps to have a glance at what may be and what have been found associated with the metal:—Gangue (this is understood by metallurgists to be a complex mixture of substances, such as stones or earthy matter in which or with which some metals such as gold, silver, bismuth, and iron are found): lead, antimony, arsenic, tellurium, selenium, iron, copper, gold, silver, zinc, cobalt, nickel, thallium (*Pharm. Journ.*, [2], iv., 302), vanadium, platinum, palladium, rhodium (?), tin, tungsten, sulphur, silica (quartz).

2nd. In the acid may exist solid matter, including chlorides and HCl; sulphates and H_2SO_4.

3rd. Distilled water, being the purest water, alone ensures the absence of traces of a multitude of things, such as compounds of calcium, magnesium, and the alkalies, especially chlorides and sulphates, resulting in the production of oxychloride and precipitation along with the silver if present, the precipitate retaining these often in a tenacious manner when they are present (*Vide* Riche, 'Year-Book of Pharmacy,' 1879).

4th. Amongst impurities due to this may be mentioned those which nitric acid solution of bismuth might dissolve from the vessels used, especially porcelain and enamelled ware; iron; particles of copper carried away mechanically from mortars made of iron or bell-metal when bismuth is powdered in them; ammonia from use of acid of different strength to the one ordered, viz., 1·420, and not using the proper addition of distilled water to dilute the acid; a parallel case is seen in the case of zinc and copper (*Pharm. Journ.* [3], ix., 849). If strong HNO_3 be used with the bismuth in powder even nitrogen is produced, and sometimes vivid flashes of light are seen. Pouring the whole nitric solution into water without separation from insoluble residue which may be present, as used to be directed in early editions of London Pharmacopœia. In this case, for probable contaminations see Dr. Letts's paper on "Bismuth Residues" (*Pharm. Journ.*, 1879). Too much or too little water used in washing, former causing it to be too basic, *the latter leaves free acid in*. Too high a temperature used for drying: this, as was said before, being a constant cause of variation.

Of other occasional impurities may be mentioned other compounds of bismuth, as hydrated oxide, phosphate, oxychloride, or oxysulphate, silica, sulphate of calcium, nitrate of alkalies (their hydrates or carbonates being used to saturate acid in supernatant liquors in order to obtain a greater yield). Particularly with reference to ammonia has this been noticed by a friend, who uses very large quantities of this preparation in combination with bicarbonate of sodium, the impurity being present sometimes to such an extent as to evolve very strongly the odour of ammonia gas, when the alkaline bicarbonate and the subnitrate were rubbed together in a mortar. Tichborne (*Pharm. Journ.*, 1860) asserts that manufacturers used chloride of sodium in the production of this preparation, which might account for the amount of oxychloride found in some commercial samples examined by Ekin (*Pharm. Journ.*, [3], iii., 381), and also the presence of silver which would be precipitated as chloride.

Of the above list of impurities the following were sought for in five different samples obtained from as many different manufacturers. The methods employed are given with other methods and also a tabulated list of results:—arsenic, tellurium, silver, lead, copper, iron, sulphur (which would occur as sulphate), ammonia, calcium chloride, phosphate, and carbonate.

1st, *Arsenic.*—It is well known that the B.P. process (Quesneville's) for the purification of the metal does not effectually remove this element. It is found in variable quantities, generally traces only, and in fact Parrish states that physicians believe that its presence has some bearing upon its therapeutic action and perhaps adds to

its efficacy. M. Lassaigne detected one-sixth of 1 per cent. by Marsh's test. M. Glenard recommends heating strongly with acetate of potassium, and noticing if the odour of cacodyl is evolved. Another method is to treat with HCl, and collect vapours of $AsCl_3$; pass sulphuretted hydrogen gas into it and weigh as As_2S_3. The comparative method of Otto was used for the results subjoined, viz., Marsh's apparatus to which a $CaCl_2$ tube is attached to arrest moisture and the gas passed through combustion tubing drawn out in bulbs one inch long, these bulbs being strongly heated. The deposit of As, collected beyond this bulb, is noticed and amount compared with the deposit obtained from chemicals alone, as sulphuric acid and pure zinc are not absolutely free from arsenic. Before placing the bismuth subnitrate in the flask, it is evaporated to dryness in a fume chamber with some sulphuric acid, by which means the nitrate radical is eliminated. The hydrogen apparatus is allowed to go on uninterrupted for thirty minutes in each experiment.

Tellurium.—In this experiment advantage is taken of the reducing action of SO_2 on this element. A hydrochloric solution is prepared from the sample to be tested by evaporation to dryness with HCl two or three times, this repeated operation eventually leaves little HNO_3 in the solution to interfere with the action. To this solution thus prepared sulphite of sodium is added, and the whole warmed. If only traces are present a reddish coloration is produced, but if much be present, then after a time a dark coloured deposit of tellurium takes place. It is advisable to operate on a couple of drachms or so. This impurity makes itself evident by the peculiar fœtid odour of garlic which it communicates to the breath of patients who take bismuth for any length of time.

Silver.—Turach says that small quantities of silver cannot be detected by means of the usual reaction with hydrochloric acid or chlorides. The method adopted turned on the fact that bismuth when subjected to cupellation behaves in the same manner as lead, that is, becomes oxidized, and the Br_2O_3 formed is absorbed by the small cup-like moulds made of calcic phosphate or bone ash and designated cupels, leaving the silver as a shining bead behind. The bismuth subnitrate is ignited, and the resulting bismuth oxide gradually thrown into a heated porcelain crucible containing cyanide of potassium in a liquid state; this yields the metal, which settles at the bottom as a bright shining metallic mass, and may be seen very easily through the clear liquid cyanide and cyanate after a few minutes' heating. The whole is quickly poured into a crucible lined in cone-like fashion with asbestos, taking care that all the metal is transferred in one bead, and allowed to cool. Warming the mass in a beaker removes adhering cyanides and asbestos and a clear round metal bead is obtained, and this is proceeded with in the usual way prescribed for cupellation of metallic beads of lead and bismuth.

Copper.—Wood detects Cu by precipitation of the nitric acid solution (evaporated until a pellicle forms on the solution) by means of solution of ammonic chloride, the copper being left in the supernatant liquid; after some hours' repose, filter, add AmHO in excess and proceed in usual way (*Pharm. Journ.*, p. 317, [2], vol. x.). Ekin examined for Cu by addition of AmHo in excess to nitric acid solution, and treating the clear supernatant liquid with excess of acetic acid; on addition of ferrocyanide of potassium a red-brown precipitate is obtained. The latter test was used.

Iron.—The sample, gently ignited to remove all nitric radical, was dissolved in hydrochloric acid and diluted with water until turbidity began to show itself, sulphuretted hydrogen passed through until bismuth was completely precipitated, filtered, and to the filtrate, evaporated to remove as much acid as possible and then diluted with water, ferrocyanide of potassium was added. Care must be taken in this experiment that the hydrochloric acid is not present in such a quantity as to cause a *green* coloration with the reagent, which might be mistaken for traces of iron.

Lead.—The Pharmacopœia reagent used in testing for this impurity sometimes may give a precipitate when lead is absent. A. Riche (*Journ. Chem. Soc.*, page 841, 1878) states that the precipitate is very complex and may consist of sand, gelatinous silica, silicates, bismuth, silver, iron and especially lime in the state of sulphate. Carnot (*Journ. Chem. Soc.*, page 473, 1878) examined some specimens and found in seven samples ·011, ·016, ·023, ·032, ·038, ·065, ·098, grm. respectively, in the quantity operated upon, viz., 10 grms., and adds that these results should serve as a caution to those engaged in preparing and dispensing this drug. The B.P. method was used (rendered more sensitive by addition of a little spirit), and also one by Chapuis and Linnoissier (*Comptes Rendus*, 87, pp. 169–171), which was used qualitatively. The latter process consists in boiling the subnitrate with caustic soda and a small quantity of potassium chromate, the residue, after boiling, being separated by filtration. To clear the filtered liquid, acetic acid is added until slightly acid, when a yellow precipitate or cloudiness will be produced according to the quantity of lead present. Calcium phosphate containing silica and alumina, if present, and also impure soda, if it contains alumina and silica, of course, interfere with the latter reaction.

Chlorides.—Usual method, care being taken to begin with clear bismuth solution, formed with as little nitric acid as possible, for fear the acid solution might retain traces. Probably the removal of chloride by ebullition with pure fixed alkali would be better, adding excess of HNO_3 to filtrate and then reagent.

Carbonates.—No effervescence with acids.

Sulphates.—These might arise from wash water or oxidation of sulphur in the metal by HNO_3. The usual method, using as much water as possible to dilute the acid solution and $BaCl_2$ if in too acid solution, causes a precipitate which might be mistaken for $BaSO_4$; this, however, is insoluble on addition of more water. Nitrate of barium solution gives a precipitate which might be taken for sulphate. This, however, is insoluble on addition of more water.

Ammonia.—Ebullition with solution of fixed alkali and placing a piece of moistened red litmus in the neck of the flask in such a way as to prevent the alkali spirts coming in contact with the test paper.

Silica.—Through the courtesy of a friend, a specimen containing 3–5 per cent. of this substance was examined. Suspicion was aroused on account of the low price it was offered at in the market. Its insolubility readily reveals its presence.

Phosphate of Calcium.—As this has occurred in commercial samples on several occasions a method is given in some text-books for its detection. One originally devised by Monsieur Roussin (*Pharm. Journ.*, [2], x., p. 88), and modified by Messrs. Howard (*ib.*, p. 165), was shown to be liable to error (*ib.*, p. 347) by Mr. G. G. Hornsby. The method suggested by Dr. Tilden (*Pharm. Journ.*, [3], i., 504) is better, and was the one used, viz.:—A dilute nitric acid solution is taken and completely precipitated by means of sulphuretted hydrogen, filter and expel excess of H_2S by boiling; test a small portion of filtrate so treated for phosphoric acid by the molybdate of ammonium test, which gives a yellow colour if present. Another portion is tested for lime by neutralizing with ammonia, then adding acetic acid in excess, and lastly, oxalate of ammonium. A white precipitate of oxalate of calcium will be formed.

Other salts of bismuth may be examined as above for phosphate, oxychloride and sulphate.

The oxychloride has a soapy feel, and is amorphous; the same character also distinguishes the oxyhydrate when viewed under the microscope, after being moistened with a little water and a thin piece of glass placed over in the usual way.

TABLE OF RESULTS.

Microcharacter.	Arsenic.	Tellurium.	Ag.	Cu.	Fe.	Pb.	Ca.	Am.	Cl.	SO_4.	H_3PO_4.	Insoluble (Silica, etc.).	CO_2.
1. Very small crystals, cubical transparent, uniform.	Traces.	Traces	Absent.	Absent.	Faint traces.	Faint traces.	Absent.		Traces.	Traces.		Trace q.s. to cause turbidity of nitric solution.	Absent.
2. Crystals, size various, transparent, prismatic,	Excessive traces.	Absent.	Present (small quantity).	Absent.	Absent.	Faint traces.	—		Traces.	Absent.		Absent.	Absent.
3. Crystalline uniform needles, transparent.	Very small traces.	Fair traces.	Absent.	Absent.	Very faint trace.	Absent.	—	Absent in all.	Traces.	Traces.	Absent in all.	Absent.	Absent.
4. Regular crystals, prismatic uniform, transparent.	,,	Absent.	Absent.	Absent.	Very faint trace.	Absent.	—		Absent.	Absent.		Absent.	Absent.
*5. Crystalline, size various, prismatic, transparent.	Traces.	Absent.	Absent.	Absent.	Absent.	Fair traces.	About 1 per cent.		Traces.	Traces.		Absent.	Traces.

PHARMACY.

We frequently hear of explosions in pharmacies, but some it is a pleasure to find are not attended with any serious loss of life or property. Amongst this class may be mentioned mixtures which are very frequently prescribed by medical men, containing *ex. gratiâ*:—

℞ Bismuthi subnitratis
Magnesiæ carbonatis
Sodæ bicarbonatis
Aquæ menthæ piperitæ.

One operator might mix this and find nothing remarkable in his result; another, while checking such a mixture, finds after he has neatly finished it off, that the bottle bursts in his hands; a third is annoyed by the porter coming back again in a great hurry with the startling news that "a bottle has bursted" in his basket and marred the neatness of the packages; and lastly the patient sometimes experiences a species of fright when he or she observes such a phenomenon, and often wonders if the contents were a liquid explosive, or some other dreadful thing. Friend after friend has been asked "What would be the result of mixing this?" (the above prescription), and the opinions are astonishingly different. On this subject Mr. J. W. Yeats offers an explanation, and sends a copy of prescription (*vide* Dispensing Memoranda, *Pharm. Journ.*, [3], vii., 1055). He found the bismuth acid, and that double decomposition took place between the bismuth and carbonated alkalies thus:—$4BiONO_3 + 4NaHCO_3 = 2Bi_2O_2CO_3 + 4NaNO_3 + 2H_2O + 2CO_2$, the evolved CO_2 causing the mischief. A week later "An Assistant" states that he has made up similar mixtures, and has never met with such an occurrence. In vol. viii. of same series, page 66–67, the suggestion is made that the sample of bismuth should be examined, and it is said that decomposition is not a necessary result of such a combination; however, in such cases the writer of the prescription should be seen, and bismuth carbonate suggested to him as a good substitute. Reference may be made to Mr. Green's paper in *Pharm. Journ.*, [3], vol. ix., p. 505, in which experiments are described to show that decomposition does really take place, with effervescence and evolution of CO_2. This may be obviated, he says, by using neutral carbonates, which simply produce bismuth carbonate without evolution of CO_2. He recommends trituration of the two salts with hot water, and letting the the mixture cool before putting it in the bottle with the other ingredients. Probably such reactions are due in a great measure to variability of the bismuth. Some time ago a peculiar specimen was examined which was very acid indeed, so much so as to be easily tasted and smelt. It had been rejected by a medical man and effervesced strongly with alkaline carbonates. Rightly prepared this preparation should be very slightly, if at all, acid to litmus; when it becomes very acid it should be washed with a little water, and dried at the B.P. temperature and well preserved. That washing does make it more basic was proved by boiling ½ ounce in much water, pouring on to a filter, and washing very frequently with boiling water for two days, then drying at 150° F. until it ceased to lose weight:—1 gram gently ignited gave (mean of two results)—before washing 80·72 per cent. Bi_2O_3; after, 87·940 per cent. Bi_2O_3.

* A specimen was suspended in water, and the clear supernatant liquid being afterwards filtered was found to be acid to litmus and to contain bismuth in solution. The precipitate cleared by filtration and once washed, and dried at 150 F., effervesced slightly with acids, and solution after removal of bismuth with H_2S gave, after boiling and addition of ammonia, a rather large trace of calcium when oxalate of ammonium was added. It was examined by the spectroscope which immediately showed the peculiar light green band of calcium strongly.

In the first four instances, the per cent. of Bi_2O_3 in each (mean of two results) was found to be respectively 80·73 per cent.; 79·80 per cent.; 80·50 per cent.; 79·80 per cent. Unfortunately, the process adopted for the estimation of the nitric radical was not found to be trustworthy.

Parliamentary and Law Proceedings.

SUPPOSED POISONING AT WEST MALLING.

On Wednesday a Coroner's inquiry into the circumstances attending the death of Sarah Ann Wright, aged 16, daughter of a labourer at West Malling, was resumed before Mr. Joseph Rogers, county coroner.

The deceased, it appeared, had been ill for some time, and a few days before December 14, she was visited by the Rev. J. H. Timins, the vicar, who prescribed some medicine for her. On December 16, the rev. gentleman again saw her, and he then, after obtaining a glass and a spoon from the deceased's mother, gave her something from a bottle he produced from his pocket. No sooner had the poor girl swallowed this than she called out three times "Oh, Mr. Timins," then vomited more than once, and in about an hour and a quarter she died. Medical aid was at once procured, and two days afterwards the coroner held a preliminary inquiry into the matter. The same day a *post-mortem* examination was made by two local practitioners and as a result of their investigation they stated that the cause of death was poisoning by prussic acid. Various portions of the body were subsequently analysed by Professors Heaton and Tuson of London, and they reported that prussic acid had been found in the vomit and contents of the stomach, the amount discovered being about a-hundredth part of a grain, and essential oil of almonds was also found and separated. Death undoubtedly arose from a nerve poison, which in this case was prussic acid. The manner in

which the poison came to be given to the deceased appeared from the evidence of Mr. Timins, who was duly cautioned by the coroner, and of Mr. Stedman, a chemist at Malling. The rev. gentleman's son had broken his arm and when he had recovered somewhat his father sent for some oil of almonds to reduce a nettle rash that appeared, and it was used externally with success. The bottle was put on a shelf with other poisons, but when Mr. Timins wanted some harmless expressed oil to give to the deceased he took a bottle from among others from a shelf where he did not keep any poisons, without noticing particularly which of the phials he took. He mistook it for another oil which was not dangerous. Mr. Timins further stated that he was under the strong impression that he was administering a harmless medicine to the deceased, and that when he saw the effect it had on her he himself swallowed a teaspoonful without any serious inconvenience. The chemist was positive that the bottle he sent to Mr. Timins was marked "poison," and the contents properly described. When he received the order he sent to inquire whether a mistake had not been made, and the rev. gentleman replied that he required the oil for outward application. The inquiry was adjourned for a fortnight.—*Times.*

Obituary.

Notice has been received of the death of the following:—

On the 30th of December, 1882, Mr. William Kemp, Pharmaceutical Chemist, High Street, Horncastle. Aged 54 years. Mr. Kemp had been a Member of the Pharmaceutical Society since 1848.

On the 3rd of January, 1883, Mr. John Roberts, Chemist and Druggist, Pye Bank, Sheffield. Aged 79 years.

BOOKS RECEIVED.

Jahresbericht über die Fortschritte der Chemie und verwandter Theile anderer Wissenschaften. Fur 1881. Zweites Heft. Giessen: J. Ricker. 1882. From the Publisher.

Sur l'Extraction des Matières Colorantes des Urines Bleues (Indigotine et Indirubine). Par le Dr. C. Méhu. Paris: 1882. From the Author.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

The Preliminary Examination.

Sir,—Perusing the Journal of January 6, I was considerably surprised to read the letter of your correspondent A. W. S., who, in my opinion, is too far outside the pharmaceutical world to broach such a subject as the Preliminary examination.

I contend that the examination in question is sufficiently strict and that to add more subjects will tend to discourage the younger members of the profession. If Cæsar, Book I., is so familiar, then select another author. The fact of a boy passing the examination is not, I admit, a proof of his proper education any more than the Major qualification is a guarantee that the possessor of it is incapable of making a mistake in his after career; the test is put and from the reply given to his question the examiner infers what the candidate knows and what he does not know, and from the inference drawn either passes or plucks him. Should the examination be made more harsh when so many fail in their attempt to pass even as it is now? The answers that are required from candidates in the Preiminary are perfectly sufficient to test any boy's elementary knowledge. I speak from experience, having both failed and passed not twenty years ago. A chemist is so seldom called upon to analyse English grammar that his pupils may well be excused examination in analysis.

Are there so many qualified assistants that it is necessary to place obstacles in the way of those wishing to enter the ranks? I think not. Are the advantages in this age of competition, both home and foreign, so great in our profession, that the trainers should be so heavily handicapped? Does the qualified man get such short hours and such a heavy salary to compensate him for the trials he had to undergo when being coached or reading for his examinations? Ask the assistants of London who, after having got through their apprenticeship, are working one hundred hours per week, exclusive of night work, which is generally very considerable, and for these—shall I say privileges?—are paid, with but few exceptions, a most miserable and paltry sum.

Possibly there exists in the imagination of A. W. S. a model college where, by an examination hitherto unknown, the defective may be sifted from those who have received a proper education. Many schemes, good perhaps in theory, are failures in practice, and to increase the severity of the Preliminary is unnecessary, and would, I feel confident, have a very injurious effect.

In conclusion, kindly permit me to ask a question, Why should candidates for the Major and Minor, when they fail to satisfy one examiner be examined again in the subjects in which they have previously been successful? I believe such is not the case in the medical examinations.

A. E. H. B.

Permanganate of Potash Pills.

Sir,—In the *Lancet* of January 6 permanganate of potash pills, containing 1 or 2 grains of the salt, are recommended by Drs. Ringer and Murrell for amenorrhœa. Having, during the last few days heard of cases of their spontaneous combustion, which is probable will occur if the common excipient containing glycerine, now generally used by dispensers, be used to mass them. I wish to point out that any readily oxidized excipient should not be used. Having prepared a quantity of the pills I found the following basis to answer best:—Vaseline, 2 parts; paraffin wax, 1 part; melt, stir till cold, and add kaolin, 3 parts; mix well. This binds the powdered permanganate together, and with a little dexterity the pills may be rolled out without much difficulty, and dusted over with kaolin. They may be coated with sandarach, dissolved in absolute alcohol, and rendered tasteless. Cacao butter may be used as an excipient, but it in time reduces the permanganate and it is troublesome to manipulate. In solution a dose of permanganate is very nauseous. In a tasteless pill, it dissolves slowly, and yet can be easily disintegrated; it is, besides, more agreeable to the stomach than in solution.

10, *New Cavendish Street.* Wm. Martindale.

The Manufacture and Sale of Patent Medicines.

Sir,—If the indiscriminate sale of potent remedies, covered by the patent stamp, is still to be allowed by unqualified traders, cannot some provision be made that the compounders possess at least the qualification of a vendor of oxalic acid, if not that of Pharmaceutical Chemist or M.R.C.S.?

Castle Cary. F. S. Moore.

W. M. A.—Probably the last mentioned labels would not involve the necessity for using a stamp, provided that the preparations are not advertised in any way for the relief of disease or claimed to be a specialty. But you are recommended to submit the question to the Inland Revenue authorities who alone are competent to answer it satisfactorily.

Sanitas.—We know nothing of the work. You should apply to the person under whose name it is advertised.

S. G.—Probably fermentation is set up.

Lime Juice.—We do not think it is possible to produce a preparation of the kind that "will not ferment;" the fermentation, however, may be retarded by proper precautions or by the addition of an antiferment.

Communications, Letters, etc., have been received from Messrs. Errington, Walker, Veritas, Independent, Norfolk, F.S.S., T.A.P.

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"New York Medical Journal," *August* 1880.
Dr. F. Weir,
in Lecture delivered to the College of Physicians and Surgeons, New York.

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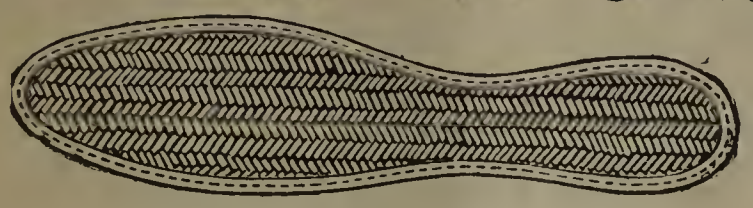

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* ,, W. R. HOPKINS.	* ,, C. RIDGLEY.
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TWO of my Students presented themselves at the December Minor; BOTH passed.

Laboratory close to Gower Street Station.

PHARMACEUTICAL PRELIMINARY,

LONDON Matriculation, College of Preceptors, Apothecaries' Hall, Glasgow, Edinburgh, and all Medical Preliminaries. Rapid and thorough preparation, privately and in class. Also postal tuition for these examinations and Bell Scholarship. For particulars enclose stamp, Mr. DAWES, 1st B.A. (Lond.), 11, Burton Crescent, London, W.C.

ENGAGEMENTS WANTED.

AS out-door ASSISTANT, or DISPENSER to Surgeon, or to MANAGE Surgeon's Retail. 9 years' experience. Good references. Disengaged. Particulars to CORTEX, 9, Market Pl., Gainsborough.

AS ASSISTANT. In-door. In London preferred. Time for study. 5 years' experience in a first-class Dispensing business. Good references. Age 21. M., Gibson & Son, Chemists, Hexham.

J. MASON, CHEMISTS' TEMPORARY MANAGER and ASSISTANT, Cranham St., Oxford. Now disengaged. Terms moderate. First-class references. Accustomed to town and country. Also Stock-taking and Accounts.

AS ASSISTANT in a good country business. Out-door. Age 23. Minor qualification. PASK, Great Gonerby, Grantham.

ASSISTANT. Age 21½. Height 5ft. 8in. Salary £30, in-doors. Steady, trustworthy and obliging. 6 years' good experience. First-class reference. Disengaged. J. W. SMITH, care of Mr. A. Hall, High St., Stony Stratford.

NO Salary.—Young man in the Wholesale Drug trade wants to learn Dispensing in the evenings. Willing to be generally useful. References unexceptional. J. DENNISON, 34, Carter St., Liverpool.

AS ASSISTANT. Where time for reading can be arranged. Address, stating time allowed, hours of business, salary (in-doors), A., 2, Hanover Pl. Regent's Park, N.W.

IMMEDIATELY.—As ASSISTANT or to MANAGE a Branch. Age 30. Disengaged on the 17th. Good references. A permanency desired. Married. ALPHA, 23, Bankhouse St., Burnley.

AS ASSISTANT in a good Retail and Dispensing. London or suburbs. Gentlemanly appearance and good address. London experience. Ætat. 23. Height 6ft. STATIM, 41, Spital St., Dartford, Kent.

AS JUNIOR. Accustomed to first-class Dispensing and Retail. 6 years' experience. Age 20. Height 5ft. 11½in. Please state particulars of duties, salary, &c. JUNIOR, 108, Western Rd., Brighton.

AS DISPENSER or ASSISTANT in a first-class house of business in London. Aged 23. In or out-door. Minor qualification. W. E., 55, Ainger Rd., Primrose Hill, N.W.

AS ASSISTANT to Chemist, or DISPENSER and BOOKKEEPER to Surgeon. Can Prescribe and Extract Teeth. Excellent references. Disengaged. BETA, 10, Arthur's Ter., Lower Sydenham, S.E.

AS ASSISTANT, in or out-door. London. 5½ years' good experience. Good references. E. CULVERWELL, Sea View House, Dunster, Somerset.

ENGAGEMENTS WANTED.

AS Junior ASSISTANT. Been accustomed to a first-class country business. Time for study preferred. Passed Prelim. Highest reference. W. L. WHITE, Bancroft House, Soham, Cambs.

AS out-door ASSISTANT, MANAGER, DISPENSER, or situation in Wholesale house. Age 27. 12 years' experience. W. J. E., 7, Royal Cres., Margate.

AS ASSISTANT or JUNIOR. In first-class Dispensing and Retail. Midland counties preferred. Ætat. 21. Can Extract Teeth. Disengaged 23rd inst. H. B., Dr. Standen, Stanton Hill, Mansfield.

AS ASSISTANT, Branch MANAGER, or Surgeon's DISPENSER. Midwifery, Prescribing, Tooth Extraction. 11 years' varied experience. Age 30. Married. Height 5ft. 6½in. Permanency desired. Excellent references. ZETA, 747, Commercial Rd., E.

AS ASSISTANT. Disengaged. In or near London preferred. Age 22. Height 5ft. 6in. 6 years' experience. Minor and Hall qualifications. CHEMICUS, Highfields, Ryburgh, Norfolk.

MANAGER or otherwise. Good reference. Terms moderate. Total abstainer. Age 31. Passed Minor. CHEMICUS, 1, Garibaldian Villas, Somerset Rd., Tottenham.

AS ASSISTANT or MANAGER. In or out-door. Age 29. 14 years' experience. Good Prescriber. Can Extract Teeth. Reference last employer. G., care of C. Hindle, Loveclough, near Rawtenstall.

AS ASSISTANT. Disengaged. Height 5ft. 8in. Over 7 years' town and country experience. B. A., 12, Sultan Ter., Great Yarmouth.

AS Junior ASSISTANT for country business. Age 18. 4 years' experience in good Mixed business. Good references. W. H. BURNETT, Mr. Kemp, Chemist, Lincoln.

AS ASSISTANT. Ætat. 23. Excellent references. A permanency. Usual particulars to T. BRAND, 80, Belgrave Gate, Leicester.

AS ASSISTANT. In London. With time to attend evening classes. Good Dispensing experience. First class references. S. E. district preferred. W. HILDYARD, Woodbridge, Suffolk.

BY February 7th.—As ASSISTANT. Good class Retail and Dispensing. W. or S.W. counties preferred. Age 25. 9 years' experience. Town and country. Minor qualification. Good references. ALPHA, 52, Robertson St., Hastings.

LOCUM TENENS, or Temporary ASSISTANT. Qualified. By the day, week, or month. Town or country. CHEMICUS, 6, Manchester St., Gray's Inn Rd., London, W.C.

A GENTLEMAN of good experience (studying for the Major) desires an engagement for few hours daily, or one with time for study. Salary moderate. J., 52, Great Dover St., Boro', S.E.

AS MANAGER, in the country, by a Pharmaceutical Chemist. Good and extensive experience. Highest references. Dental qualification. ALPHA, care of Mr. Perkins, Treffgarne, Pembrokeshire.

AS JUNIOR or IMPROVER. 3 years' experience. Good references. C. F. PAYNE, Lime Villa, East Peckham, near Tonbridge.

IMMEDIATELY. — In an Wholesale warehouse. Either Wet or Dry Counter. Good writer. Good reference. State wages to J. J. E., care of Sturton & Sons, Wholesale Druggists, Peterborough.

AS ASSISTANT in good class Dispensing and Retail business, with view to succession or partnership. Major qualification. West-end and country experiences. PHARMACIST, Messrs. Hodgkinson & Co., 198, Upper Whitecross St., London.

ENGAGEMENTS WANTED.

AS MANAGER. London or suburbs. Thorough town experience. First-class references. Last situation over 6 years. Middle age. Married. P. B., 65, Malvern Rd., Dalston, E.

ASSISTANTSHIP desired. Trustworthy. Single. Sober. Non-smoker. Height 5ft. 8in. Englishman. Manage a Branch. Age 37. Testimonials, &c. CHEMIST, Mr. Leclair's, 402, Caledonian Rd., London.

AS ASSISTANT. Age 24. Minor qualification. Good experience. In or out-door. Yorkshire preferred. State salary, &c. H. C., 74, Mountgrove Rd., Highbury, N.

AS ASSISTANT. Age 21½. London experience. Can Prescribe and Extract Teeth. A comfortable home appreciated. J. J. PIERCE, 38, Duke St., Grosvenor Sq.

BY Advertiser. In a good Family and Dispensing business in London suburb, with view to early succession. Excellent references. F. W., 20, Huntley St., Bedford Sq., W. C.

BY the son of a Surgeon, an engagement at a Retail Chemist's, where he can give his services in return for a comfortable home and a knowledge of the business. T. W., 23, Hayter Rd., Brixton, London.

AS MANAGER, Branch or otherwise, by a Registered Chemist. Aged 45. Experienced in good class Retail, Dispensing and Prescribing. Temporary entertained. B. C., 47, Ovington St., Chelsea, S.W.

ADVERTISER, who has passed Preliminary examination and had 2 years' experience in a high class business, desires an engagement in London or vicinity. R. N. TREDINNICK, St. Austell.

IN a small business, with a view to ultimate succession. Country preferred. F. PHIPPS, jun., Chalton, Dunstable, Beds.

ASSISTANTS WANTED.

MR. F. WARREN SMITH, 7, High St., Yeovil, will have a vacancy for a JUNIOR (in-door) after the 1st proximo. Must be competent to undertake the Dispensing at local Hospital two afternoons a week. Senior kept.

AN educated youth as a PUPIL in the Dispensary of the Victoria Hospital for Children, Queen's Rd., Chelsea. For full particulars apply at the Hospital.

TO Pharmaceutical Chemists.—By an old established house in Dublin, who are adding a Compounding Department to their general business, a fully qualified man of experience to conduct it, as well as assist in the other branches. Enclose copies of testimonials and full particulars, stating religion, age, height, whether married or single, and expected salary. Address, BEATER & Co., 17, Lower Sackville St., Dublin.

WHOLESALE. — A WAREHOUSEMAN. Must have thorough knowledge of his work. Apply, stating previous engagements, references, and salary expected, to Y. & Co., care of Messrs. Horner & Sons, Mitre Sq, London, E.C.

FOR the Continent. — A good ASSISTANT, speaking French. Address, X. Y. Z., care of Messrs. Davy, Yates & Routledge, Park St., Southwark.

AN ASSISTANT, to proceed to India. Age about 26, and unmarried. Must have passed Minor examination. Four years' agreement. Salary, 1st year 150 rupees, 2nd year 200 rupees, 3rd year 225 rupees, 4th year 250 rupees, per mensem. Apply by letter only to Messrs. ALEX. LAWRIE & Co., 14, St. Mary Axe, London, E.C.

A JUNIOR ASSISTANT or IMPROVER, for Mixed country business. Address, with reference, M. HUMPHREYS & SON, 6, Middle Marsh, Nottingham.

ASSISTANTS WANTED.

FOR a light Retail and Dispensing business. Must be an experienced Counterman and Dispenser, possessing good business abilities. No night or Sunday duty. Address, stating salary required, experience, age, height, and when disengaged, enclosing carte, if convenient, to ARTHUR BAINES, Piccadilly Bldgs., Hanley.

A COMPETENT ASSISTANT. About 25 years of age. Must be a neat and accurate Dispenser and well up in the Retail. Apply to W. PINYON, Chemist, 49, Abbey Rd., St. John's Wood, N.W.

A STEADY and careful young man, about 18 or 19 years of age, with 2 years' good experience and first-class reference, who has passed Preliminary. One seeking a permanency and willing to make himself useful and obliging will find this an excellent opportunity, with good home and fair salary given. Apply personally to W. M. COVELL, Hackney Dispensing Pharmacy, 302, Mare St., London, E. Established 1808.

JUNIOR or ASSISTANT. Steady. Obliging. Good class trade. Easy hours. Others kept. South Coast. RHEUM, care of Messrs. Barclay & Sons, 95, Farringdon St., London.

FOR the Wholesale.—As SALESMAN in Showroom. Salary £150 per annum. S. MAW, SON & THOMPSON, 7 to 12, Aldersgate St., London, are in want of a gentlemanly young man, about 24, in the above capacity, who has been accustomed to first-class Retail, and who speaks French fluently. Applications not answered within a week may be considered declined.

A TRUSTWORTHY ASSISTANT. A steady young man, not under 24, of thorough business habits. Accustomed to light Retail and Prescribing. Apply, stating full particulars, and enclosing carte (to be returned), to J. COLEMAN & Co., 265, Whitechapel Rd., London, E.

WARNEFORD Hospital, Leamington. — Immediately.—A Resident DISPENSER. Salary £40, with board, lodging and washing. Applications, stating age, qualification, and testimonials or references, addressed to the Chairman of Committee, to be sent not later than Tuesday, 23rd January, to the House Surgeon, from whom further particulars may be obtained.

Jan. 11, 1883. WILLIAM MAYCOCK, Secretary.

APPRENTICE.—CHAS. H. RIDLEY (successor to Wimble & Co.), Wholesale Druggist and Family and Dispensing Chemist, Maidstone, has a vacancy for a respectable, well educated youth as an APPRENTICE. Indoors. Premium required, but time for payment could be arranged.

MR. S. V. HOLGATE, 29, Long Row, Nottingham, has a vacancy for a competent ASSISTANT. Applicants must be qualified, not under 23, and accustomed to good class business. Commencing salary £80, with furnished apartments, &c.

IMMEDIATELY.—A thoroughly competent ASSISTANT, about 25, for Dispensing counter. Good writer. Apply, with carte and usual particulars, JAMESON & CURTIS, Hastings and St. Leonards.

A COMPETENT ASSISTANT. Age not less than 24. Must have been accustomed to a good class Dispensing and Retail business. Apply personally to Mr. PHILLIPS, Pharmaceutical Chemist, Broadway, Ealing, W.

IMMEDIATELY.—A Junior ASSISTANT (out-door). Apply, with full particulars, to H. PEARMAN, Commercial St., Newport, Mon.

AN ASSISTANT, of good experience and address, about 23 years of age. Address, G. M., care of Hodgkinsons & Co., 198, Upper Whitecross St., London, E.C.

JUNIOR ASSISTANT or IMPROVER. Where two are kept. In a Dispensing and Agricultural business. Apply, giving usual particulars, to J. L. DAVIES, Pharm. Chemist, Hay, R.S.O.

ASSISTANTS WANTED.

AN ASSISTANT (in-door) for a good Mixed country business. Apply, with photo., stating age, height, salary required, with full particulars and references, to KEMP & SON, Chemists, Horncastle.

IMMEDIATELY.—A trustworthy ASSISTANT, accustomed to good class trade. Must be a neat writer and accurate Dispenser. One who has passed his Minor preferred. Apply, stating usual particulars, to RICHARD H. GROVES, Pharmacist, Blandford.

A SENIOR. Out-door. Must be a quick and accurate Dispenser and good Counterman. Address, stating particulars of former engagements, X. Y. Z., care of Messrs. Idris & Co., 10, Aschaw St., Kentish Town.

PILL-COATERS. Steady work for good workmen. Address, PILL, care of Lee & Nightingale, Advertising Agents, Liverpool.

A COMPETENT ASSISTANT. Gentlemanly and good address. Age 24 to 30. Apply, J. HILL, 1, Castle St., Reading.

AN active ASSISTANT for Retail Drug Counter. Short hours and no Sunday duty. Apply by letter to F. M., care of Cooper Bros. & Co., 11, Long Acre, London, W.C.

IMMEDIATELY.—For a Branch business. An experienced ASSISTANT, about 30 years of age. For a Retail business. One accustomed to Prescribe and Extract Teeth, and who is desirous of permanency preferred. Address, stating age, height, references, salary required, and enclose carte (to be returned), to Fox & Co., Chemists, Broadway, Leyton.

A GENTLEMAN, engaged in study during the forenoon and afternoon, wishing to give the rest of his time for board and lodging. Apply, giving age, height, experience, and references, and if by letter enclosing photograph, to H. J. LANGHAM, 74, Mountgrove Rd., Highbury. Applications four days unanswered declined.

ASSISTANT. About 22 years of age. For a light Retail and Dispensing business. One requiring time for study would be suitable. Apply, stating age, height, salary required, to G. C. Fox, Chemist, Old Charlton, Kent.

ASSISTANT. About 22 years of age. Accustomed to good class trade, and experienced Dispenser, with Minor qualification. Apply by letter, stating salary, height, and full particulars of previous engagements, to VINES & FROOM, 75, Aldersgate St.

AN ASSISTANT for a first-class Dispensing business. Minor qualification. Must be an accurate and quick Dispenser and good Counterman. State salary expected and usual particulars to JOHN BAILY, 44, Hampstead Hill Gardens, N.W.

BY 24th of this month.—As Second ASSISTANT. Age about 23. Middle height. Minor or Hall qualification. Accustomed to superior class of business. Experienced Dispenser. Good writer. Business hours, 8 to 8.30. Allowed one night a week, from 5.30 to 11, and another night from 9 to 11; whole of every other Sunday. Commencing salary £45. Useless writing. Must apply personally, morning, 10 to 12, evening, 6 to 8. WHITE & SON, 19, Park Ter., Regent's Park.

APPRENTICE to Chemist in Geneva.—Exceptional opportunity to learn the Chemist's business in all its branches, besides the French and German languages. Youth must have good character, and passed Oxford or Cambridge Local examination, or an equivalent. Apply WILCOX & Co., 239, Oxford St., London.

AN ASSISTANT. In the West-end of London. Not under 25 years of age. One who has passed the Minor. Four kept. Address, A. B. C., care of Messrs. Horner & Sons, 2, Mitre Sq., Aldgate, E.C.

ASSISTANTS WANTED.

APPRENTICE.—A youth, about 16 or 17. One who has passed Preliminary examination preferred. Light Retail business. Two hours a day allowed for study, also time to attend lectures, and every assistance afforded towards passing examinations by end of apprenticeship. No Sunday duty. Premium required. References given. For full particulars apply to E. HOWARD, Chemist, 184, Old Kent Rd., London, S.E.

A JUNIOR ASSISTANT for Mixed country business. Neat Dispenser and good Counterman. State all usual particulars and salary required to HY. MORNEMENT, Family Chemist, 157, King St., Gt. Yarmouth.

YOUTH, as IMPROVER, who has some knowledge of Post Office work. Time for study or lectures. No salary first six months. Apply by letter to OMEGA, care of Messrs. Evans, Lescher & Webb, Bartholomew Close, E.C.

IMMEDIATELY.—A Junior ASSISTANT. Apply, with reference and carte, to R. RYOTT, Chemist, Newbury.

A GENTLEMANLY Junior ASSISTANT, for the first week in February. One just out of his apprenticeship treated with. If required, time would be allowed for study. Salary and full particulars to J. M. BUCK, Pharmaceutical Chemist, Bedford St., Liverpool.

IMMEDIATELY.—A JUNIOR in a Mixed country business, with good Retail and Dispensing. Apply, stating full particulars, to SPONG & SON, Chemists, Biggleswade, Beds.

BUSINESSES FOR DISPOSAL.

TO be exchanged or sold, a thriving BUSINESS in South Devon. Returns about £550. Profits about £230. Price, if sold, £450; or would exchange for suitable business at seaside in South of England. Ill-health is the sole cause of disposal. Address, S., 100, New St., Birmingham.

LLANDUDNO.—A high-class genuine light Retail and Dispensing BUSINESS. Returns, under manager, £500. Fullest investigations invited. Satisfactory reasons for disposal. Apply, J. VINCE, Chemist, Lancaster.

IN a large Colliery village in Derbyshire.—Population 3400. No opposition. Rent £25. Good stock and valuation. Price £100 cash if taken to at once. For further particulars apply to A. J. STRATFORD, Stonebroom, Alfreton.

A VERY desirable good class Country BUSINESS. Nothing heavy. Pleasant and healthy locality. 40 miles from Liverpool. Full prices. Returns £930. Net profit £440. Price £875. Established 42 years. Changed hands once only. This is an opportunity which very rarely occurs. Address, PHARMACIEN, Messrs. Evans, Sons & Co., Hanover St., Liverpool.

A BUSINESS. In a good market town in Sussex. In consequence of the death of proprietor. Rent and taxes about £40. Incoming £350. Address, R. T., care of Messrs. Barron, Squire & Co., Bush Lane, London, E.C.

KENT.—Elegantly fitted Shop, facing very busy Station, in great thoroughfare of densely populated town, 30 minutes from Cannon St. Cash Retail and Prescribing BUSINESS, with small profitable local Wholesale; both admitting of great development. Present returns £720. Price £685. Lease. Dentist wanted. M., Sanger, 489, Oxford St.

AN excellent opportunity now occurs to succeed to a good old established BUSINESS of 17 years' standing, in South Lambeth. The shop is closed, but the premises are in thorough repair, and possession can be had at once. Dentistry might advantageously be added. 8-roomed house. Rent only £50 per annum, on lease. No premium. Apply to B. N., 6, Albert Sq., Clapham Rd.

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MESSRS. GURDEN BERDOE desire to call special attention to the following:—N.W. Thoroughly genuine Retail. Returning, with small wholesale of own specialities, £1250. Trial allowed. Valuable lease. Good house. Rent £50. £1000. Another. S.E. Showing £600 net profit. £1000. N. Rare opportunity. For £275. Returning £450 by manager. Another. Same hands 10 years. Returning £8 weekly. For £200. N.E. Genuine Retail. Returning £550. Pleasantly situated. Full prices. Rare chance for Dentist. £400. S.E. Bargain. Returning £7 weekly. For £120. S. Coast. First-class Retail and Dispensing. No cutting in town. Rent £25. Returning £1050. Well stocked. £1000. Inland Watering-place. High class trade. Cash about £1300. Others from £50. Please apply, 30, Jewry St., Aldgate, City.

IMMEDIATELY.—Prescribing, Dispensing and light Retail. Well situated in thriving market town in Midlands. Takings average £8 per week, without assistance. Might be doubled by energetic man. Good house and premises. Private entrance. Easy rent. Excellent opportunity. Serious illness cause of sacrifice. Price £150, or fair offer. Apply, X. Y. Z., 18, Ship St., Brecon.

IMMEDIATELY.—A genuine good class Business. In London, E. Established 20 years. Modern fitted shop. Well stocked. Returning over £500. Full prices. Long lease. Good house. Address, E. H., care of Barron, Harveys & Co., Giltspur St., E.C.

MANCHESTER.—To be sold, freehold shop, house and premises, which carries with them the goodwill of one of the oldest Businesses in the centre of the town. Excellent opening for druggist who can practice Dentistry and Prescribe. Price £5000, of which £3500 may remain on mortgage. Early possession can be given. Application by principals or their solicitors only to Withington, Petty & Boutflower, Solicitors, Spring Gardens, Manchester.

GENUINE Retail. S.E. Established 50 years. Returning over £450. With Post Office, which pays rent. Could let off £30 per annum profit rental. £300 to an immediate purchaser, who, if a steady worker, could save the amount in 18 months. Every investigation courted, this being a thoroughly good and profitable trade, bearing a cent. per cent. profit. Proprietor taken larger concern. G. T. C., 32, Argyle Sq., W.C.

SOUTH-EAST Coast.—Profitable cash light Retail, Prescribing and Dispensing. At full prices. In popular watering-place. Good corner shop and large house. Rent £40, on lease. Returns last year £550. Excellent opening for Dentistry. Price £400. Mr. Brett, Valuer, Leicester.

LONDON, N.—The proprietor of several Chemists' Shops, carried on by Assistants, at full prices, is open to negotiate sale of same. Returns each about £600. Prices ranging from £600 to £800. Address, in first instance, to Chemist, care of Messrs. Newbery & Sons, 1, King Edward St., Newgate St., London, E.C.

TO young men of energy and industry.—In a watering place. A Business, in a commanding situation, near market. Established about 8 years. Incoming about £300. If security is given no deposit will be asked. Can be paid over a period to suit purchaser, who must be single. Communications not replied to in three days declined. Apply to Thomas Fore, Chemist, Birkenhead.

MIDLANDS.—Good class cash for disposal. Returns average £1600. Many years present hands. Commodious house and premises, garden, stabling. Rent £55. Price only £800 to sell quickly. No heavy trade. Failing health cause of sale. Opportunity to energetic man rarely met. All particulars, Hine Gilbert, 17, Hart St., Bloomsbury.

HENRY GADD,

Member of the Pharmaceutical Society,

CHEMISTS' TRANSFER AGENT,

97, FORE STREET, EXETER.

Henry Gadd having had many years' practical experience of the Trade, both in Town and Country, can offer his services for Transfers, Probate, Valuations, Arbitrations, Partnership, Settlements, &c.

Particulars of the following businesses sent on application:—

7. Devon.—Very good class Trade. Price £550.
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28. Cornwall.—Valuation of stock and fixtures. Old established Chemist's and Mineral Water Trade.
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45. London, E.—On account of illness offered low. £250.
47. London, S.E.—Select Dispensing Trade. £525.
48. Cornwall.—Light Retail and Dispensing. Recently fitted shop. £500, or valuation of stock and fixtures.
50. London, W.—Ready-money Trade. Small, but capable of great extension. £200.
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Applications for sale or purchase of businesses inserted in Register free of charge.

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Licensed Valuers & Chemists' Transfer Agents,

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1. London, N.E. suburb.—Dispensing, Retail and Prescribing. Returns £500. Profits about £300. Good house. 38 years' lease.
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3. Berks.—Returns £448. Rent £36. 7-roomed house. Price £400.
4. Manchester.—Dispensing and Retail. Returns £1000. Good house. Price about £1000.
5. London, S.E.—Branch Business. Returns about £280. Rent £30. Cash price £200.
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Also a long list of other businesses for disposal. Purchasers are solicited to furnish T. & Co. with particulars as to the class of business and locality they desire, also the amount of capital they wish to invest.

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T. & Co. having been actively engaged for upwards of 20 years in the trade, vendors and purchasers consulting them have the advantage of their extensive and varied experience.

Midland Counties' Transfer Agency.

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VALUATIONS.—In consequence of the increased demand for Mr. BRETT'S services as a Valuer, it is essential, to prevent disappointment, that engagements should be made early.

Businesses thoroughly investigated for Buyers.

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F. J. BRETT'S practical knowledge of the trade in all its branches renders him specially adapted to act as trustee in Liquidations and Bankruptcies. Chemists in difficulties can have their affairs settled by private arrangement.

NORTH.—Retail and PRESCRIBING. Returning as a Branch £7 to £9 week. Capable of doing double under principal. Price £250.

MIDLANDS, centre of hunting district.—Unopposed first-class Family Retail, Dispensing and PRESCRIBING, at very best prices. Purely Drug. Large and good house and garden. Shop well fitted. Returns £484. Price £400.

First-class Retail and DISPENSING, in the fashionable suburb of large town, NORTHUMBERLAND. Returns £12 week; has done £30. Price £400.

LIVERPOOL.—Very profitable RETAIL. Under bad management £200; has done £500, and would again. Stock and fixtures worth £300. Price £200, as vendor is leaving the trade.

Unopposed village RETAIL. NORTHAMPTONSHIRE. Returns £800, and capable of much increase. On account of ill-health vendor will sell to immediate purchaser for £500. Fine house, garden, &c. Well worth attention.

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THE Stock and Fittings for a Chemist's shop. Drawers, Bottles, Shelving, Pill Machine, implements in trade. Ready for immediate removal. LINDEN, Broughton, Winchester.

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BEING about to re-organize our staff of Travellers, we are prepared to receive applications from gentlemen calling on Chemists, &c., in Scotland, North of England, Midlands, Wales, and London, who can sell our Dyes and other specialities on commission. No one need apply who has not a connection, and is already working one of the above districts. E. CRAWSHAW & Co., 80, Fann St., Aldersgate St., London, E.C.

TO BE LET.

WAREHOUSE and LABORATORY. Both well fitted up. Lately occupied by a Manufacturing Chemist. Situate close to West Smithfield. Apply to Messrs. ORRIDGE, 30, Ludgate Hill, or Mr. DUNN, 19, Charterhouse Sq., E.C.

CHEMIST'S SHOP. Kingston-on-Thames. Good position. Rent moderate. Well built and decorated. Every convenience. Apply, Mr. NEWBURY, East Cliff Pharmacy, Bournemouth.

CHEMISTS' TRANSFERS.

32, LUDGATE HILL, LONDON.

MESSRS. ORRIDGE & CO., CHEMISTS' TRANSFER AGENTS, may be consulted at the above address on matters of SALE, PURCHASE, and VALUATION.

The Business conducted by Messrs. ORRIDGE & Co. has been known as a Transfer Agency in the advertising columns of the PHARMACEUTICAL JOURNAL since the year 1846, and is well known to all the leading firms in the Trade.

VENDORS have the advantage of obtaining an opinion on Value, derived from extensive experience, and are in most cases enabled to avoid an infinity of trouble by making a selection from a list of applicants for purchase, with the view of submitting confidential particulars to those alone who are most likely to possess business qualifications and adequate means for investment.

PURCHASERS who desire early information regarding eligible opportunities for entering business, will greatly facilitate their object by describing clearly the class of connection they wish to obtain.

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The
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Transactions.

THIRD SERIES, No. 656.] SATURDAY, JANUARY 20, 1883. [PRICE FOURPENCE.

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The next EVENING MEETING will be held on Wednesday, February 7th, 1883, at Eight o'clock.

The Chair will be taken at half-past Eight *precisely*.

Papers intended to be read at that Meeting should be forwarded to the Secretary not later than Wednesday, January 31st, as papers received after that date cannot be announced in the *Pharmaceutical Journal* previous to the Meeting.

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The Board of Examiners for England and Wales meets at 17, Bloomsbury Square, London, in February, April, June, July, October, and December, and the Board of Examiners for Scotland meets at 119A, George Street, Edinburgh, in January, April, July, and October, for the purpose of conducting the above Examinations. Candidates must give notice to the Registrar in London, and pay the fee on or before the *first* day of the month in which the Examinations are held. Each candidate for the Major and Minor Examinations must, at the time of giving notice, produce a Registrar's Certificate of Birth, and a certified declaration that for three years he has been registered and employed as an Apprentice or Student, or has otherwise for three years been practically engaged in the translating and dispensing of prescriptions. Printed forms of declaration may be obtained from the Registrar in London. Each Candidate for the Modified Examination must state the number of the receipt for his declaration and his age at the time of giving notice.

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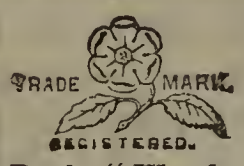

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The Practitioner of September, 1881, reports a lecture entitled "Recent Advances in the Therapeutics of Diseases of the Skin," by Professor W. A. JAMIESON, M.D., F.R.C.P. Ed. The following is an abstract therefrom:—"Itching, which owes its origin to too slow a current of blood, of which the most typical example is that seen in *Eczema* connected with varicose veins of the leg—but to the same category also many examples of Pruritus Scroti, Labiorum and Ani may be referred—is best relieved by careful flannel bandaging, well applied suspensory bandages, and laxative salts or mineral waters, which unload the rectal veins by freeing the portal circulation, combined locally with *weak tarry lotions*, one of the best of which is *Wright's Liquor Carbonis Detergens*, a well made *alcoholic solution of Coal Tar*, suitably diluted."

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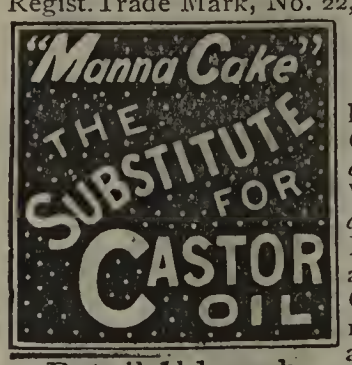

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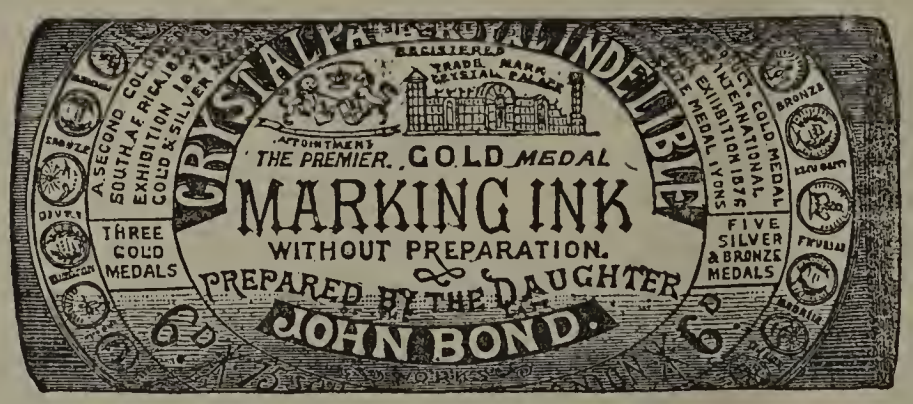

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THIRTEEN PRIZE MEDALS, FIVE GOLD.

THE NEW PHARMACOPŒIAS FOR THE UNITED STATES AND GERMANY.

(*Continued from page* 563.)

Balsamum Copaivæ, P.G.; Copaiba, U.S.P.—The botanical source of this oleoresin is now stated in the U.S.P. to be *C. Langsdorffii*, but in the P.G. it is attributed to *Copaifera officinalis* and *C. Guianensis*, instead of *C. multijuga*, as in the last edition of those works. Since, according to Mr. R. Cross's statement (*Pharm. Journ.*, [3], ix., 89), copaiba is collected indiscriminately from various species, its reference to any particular species is not of much importance. As copaiba does, however, vary considerably in proportion of volatile oil and resin, some limit in this direction might be easily imposed. Tests for the presence of gurjun balsam are now given in both Pharmacopœias, and for turpentine and fixed oils in the U.S.P. The latter adopts a specific gravity of 0·940–0·993, while the P.G. gives 0·96–0·99.

Balsamum Peruvianum, U.S.P. and P.G.—In the P.G. it is attributed to *Toluifera Pereiræ* (*Myroxylon Pereiræ*) instead of *M. Sonsonatense*, Klotsch., and in the U.S.P. to *Myroxylon Pereiræ*, Klotsch., instead of *Myrospermum peruiferum*, De Candolle. The tests for the purity of this substance differ in the two Pharmacopœias as follows:—The P.G. has altered the specific gravity from 1·15–1·16 to 1·137–1·145, while the U.S.P. gives specific gravity 1·135–1·150 (*Pharmaceutical Journal*, [3], xiii., p. 321). According to the latter the balsam is soluble in 5 parts of alcohol (specific gravity 0·820), and should show the absence of fixed oils and alcohol by not diminishing in volume when shaken with an equal weight of benzine or water. The bisulphide of carbon test is exactly that given in 'Pharmacographia,' p. 182, except that about 40 per cent. (instead of 38) of resin is said to be precipitated. In the P.G. the balsam is said to be miscible with an equal weight of spirit, specific gravity 0·830–0·834; 8 instead of 3 parts of bisulphide of carbon are to be added to precipitate the resin. This appears to be a waste of the bisulphide. According to the statement in 'Pharmacographia,' any further addition to the mixture of 1 part of balsam with 3 of bisulphide of carbon will precipitate the resin. The presence of turpentine, storax and balsam of copaiba are detected by heating the residue left by spontaneous evaporation of a mixture of 1 part of balsam with 5 parts of petroleum benzin previously well shaken together. Colophony is detected by shaking 5 drops of the balsam with 3 c.c. of liquor ammoniæ, when very little froth should be produced and a gelatinous mass should not be formed after twenty-four hours if the balsam be pure. Dr. C. Grote's test for 20 per cent. of resin or upwards is adopted ('Year-Book of Pharmacy,' 1881, p. 219), while Professor Flückiger's lime test is not given. It is not stated in the U.S.P. what admixture the distillation of the balsam with 200 parts of water is intended to detect. Peckolt states (*Pharm. Journ.*, [3], xi., 819) that balsam of Peru yields volatile oil when distilled with water, while that of *M. peruiferum* does not. It is probably intended, however, to detect oils of copaiba and turpentine.

Balsamum Nucistæ, P.G.—It is rather remarkable to find in a Pharmacopœia which so carefully distinguishes between rhizomes, roots and tubers, such an inconsistency as giving the name of "balsamum nucistæ" to an ointment containing yellow wax, olive oil and expressed oil of nutmeg.

Balsamum Tolutanum, U.S.P.—The name for the balsam of tolu tree now adopted is *Myroxylon toluifera*, Kunth., instead of *Myrospermum Toluiferum*, De Candolle. The test given for freedom from other resins is that bisulphide of carbon should dissolve out scarcely anything but cinnamic and benzoic acids. The simple test for the presence of cinnamic acid by warming a little between two pieces of glass and examining under the microscope for crystals of the acid is not given (*Pharm. Journ.*, [3], viii., 624.

Belladonnæ Folia, U.S.P. and P.G.—The U.S.P. gives the length of the leaves, but omits the breadth. The P.G. gives their length as two decimetres long by one broad, and remarks that the leaves are on both surfaces, "*albis punctis distincta*," a feature much more easy to observe on the upper than the under surface, and one which does not appear to be present in the leaves of stramonium. The dose is given as 0·2 gram or 0·6 *pro die*. In neither Pharmacopœia are any directions given as to the age of the plant from which the leaves should be collected, nor the time of year at which they should be gathered. The leaf is now the only part of the plant official in the P.G.

Belladonnæ Radix, U.S.P.—A preference for starchy roots is shown by directing the use of those breaking with a nearly smooth and mealy fracture (*Pharm. Journ.*, [3], xiii., 86), those which are tough and woody and break with a splintery fracture being disallowed. These directions, while providing against the admixture of such roots as *Medicago sativa* or marshmallow, are scarcely sufficient to exclude the root of *Scopolia japonica*, unless special attention is paid to the mealy fracture. The readiness with which the thin brown epidermis is scraped off by the nail, exposing the white starchy surface beneath, forms a feature which readily distinguishes young and good belladonna root from others of similar size and appearance. It is so difficult to obtain good samples of the root in commerce, that it is not surprising to find it omitted from the P.G.

Benzoin, U.S.P.; Benzoe, P.G.—The warning against the use of Penang and Sumatra benzoin in the last P.G. is now omitted, but the description still applies to Siam benzoin. The description in the U.S.P. also seems to be intended for Siam benzoin. As cinnamic acid is said to have been detected ('Pharmacographia,' 1st ed., p. 365) in Sumatra and Penang benzoin, as well as in some samples of Siam, the test for the absence of that acid is therefore probably intended to secure a suitable material for the preparation of benzoic acid. There is no proof that Siam benzoin is obtained from *Styrax Benzoin*, while the storax odour of the Penang variety and the vanilla scent of the Siam kind indicate that they are in all probability the produce of a different tree from that which yields Sumatra benzoin.

Brayera, U.S.P.; Flores Koso, P.G.—In the U.S.P. brayera (koosso) is now limited to the female inflorescence, and is attributed to *Brayera anthelmintica*, Kunth. The word *anthelmintica* is often erroneously spelt thus, its derivation from the Greek ἕλμινθος necessitating the use of "th" instead of "t." In the P.G. the female inflorescence is alone official; the name adopted for the koso plant is *Hagenia Abyssinica*, and the description now gives more botanical details, even going so far as to state that the fibre wound round the koosso consists of the stem of *Cyperus articulatus*.

Bryonia, U.S.P.—The roots, both of *Bryonia alba* and of *B. dioica*, L., are official. This is altogether a new addition, the drug not occurring previously in the secondary list. According to homœopaths the roots of the two species differ very much in strength and properties, that of *B. alba* being always preferred to *B. dioica*. The accuracy of this statement might perhaps be worthy of more attention than it has hitherto received now that the drug is introduced into the Pharmacopœia.

Buchu, U.S.P.—In the last edition the leaves of *B. crenata* "and other species" were official. The "other species" are now limited to *B. betulina*, Bark., *B. crenulata*, Hook., and *B. serratifolia*, Willd.

Calamus, U.S.P.; Rhizoma Calami, P.G.—This is another drug which probably finds a place in the U.S.P. owing to its use among the German portion of the population as an aromatic tonic in dyspepsia, etc. The description in the U.S.P. is not well worded, for the rhizome is described as showing numerous oil cells and *scattered* wood-bundles, the latter *crowded* within the subcircular nucleus sheath. In the P.G., 1872, the rhizome was directed to be collected in autumn and to be used only in the decorticated state. The root in its natural state is now official in both Pharmacopœias, and no directions are given as to the time of collection.

Calendula, U.S.P.—This, like bryonia, would seem to have been introduced to supply a formula for an extensively used homœopathic remedy, since it does not appear in the P.G. or in the previous edition of the U.S.P. A brief description of the flower-head is given, but no characters by which it might be distinguished from those of *Tagetes erecta*, L., and *Tagetes patula*, L., the plants commonly known as African and French marigolds, and the heads of which, according to Maisch, have been largely sold as calendula in the United States (*Amer. Pharm. Journ.*, 1867, p. 386). The achenes in these species are flattish, slender, and crowned with a few chaffy scales; the phyllaries of the involucre are united to form a tube, the receptacles are naked, and the ligulate florets are broader than in *Calendula*.

Calumba, U.S.P.—Radix Colombo, P.G.—The U.S.P. now adopts the name of *Jateorrhiza Calumba*, Miers, only, and the two Pharmacopœias consequently agree in this point.

Cambogia, U.S.P.—This is now attributed to *Garcinia Hanburii*, Hook. f. A description of the drug, and a test for its freedom from starch are given, but the proper percentage of resin is not mentioned.

Camphora, U.S.P. and P.G.—The name *Cinnamomum Camphora* is now adopted for the camphor plant. The characters given in the U.S.P., that camphor should be entirely soluble in alcohol and chloroform, and sublime without residue, are necessary since the introduction of the Japanese drug, in the manufacture of which mucilage is said to be used.

Cannabis Indica, U.S.P.; Herba Cannabis Indicæ, P.G.—The P.G. directs that the flowering tops should be more green than brown, while the U.S.P. states that the drug has a brownish colour. If it is usually met with in Germany of a greenish colour, it is not surprising that Dr. Fronmuller remarks that the extract is now four times as strong as it was thirty years ago. The P.G. is in error in giving the name of "bhang" to the flowering tops; these being known in India as "gunjah," or in the London market as "guaza." The object of retaining *Cannabis americana* in the Pharmacopœia is not evident.

Cantharis, U.S.P.; Cantharides, P.G.—The U.S.P. still retains the name *Cantharis vesicatoria* for the insect and the P.G. that of *Lytta vesicatoria*. In the U.S.P. a description and measurements are given, the latter being less than those of the P.G., which also directs that the ash left after incineration should not exceed 8 per cent. In the P.G. the maximum dose is now given as 0·05 gram, or 0·15 per day. The directions as to time of collection are now omitted. The U.S.P. orders a little camphor to be placed in a well-closed vessel with the insects; but no test as to percentage of cantharidin, or for the presence of euphorbium in powdered cantharides, is given in either Pharmacopœia.

Capsicum, U.S.P.; Fructus Capsici, P.G.—The fruits of *Capsicum fastigiatum* are official in the U.S.P., and those of *C. annuum* and *C. longum* in the P.G. The description of the dimensions in the latter is not so accurately worded as is usually the case in that work, since it admits of the construction that a conical fruit of capsicum might be 5 centimetres long and 4 broad in the lowest part, a shape which is by no means typical of commercial capsicum.

Caryophyllus, U.S.P.; Caryophylli, P.G.—In both Pharmacopœias the botanical name is altered to *Eugenia caryophyllata*, Thunb. According to the P.G. the flower-buds should be 10–15 millimetres long (12 mm. U.S.P.) and should exhibit volatile oil when scratched with the nail (U.S.P.) or split longitudinally and pressed between blotting paper. It is necessary to try this test on several specimens, as the exhausted cloves are often mixed with those in good condition, the exhausted specimens being usually moist and without petals.

Castoreum, P.G.—American (Canadian) castoreum is now official, the Siberian, which has long been almost impossible to obtain, being excluded. The powder should not melt at a temperature of 100° C., which precludes the presence of resin, with which spurious castor sacs are sometimes filled.

Cardamomum, U.S.P.; Fructus Cardamomi, P.G.—The dimensions given in both Pharmacopœias indicate that the Madras as well as the Malabar cardamoms are intended, since 2 centimetres long and 1 broad is rather an unusual size for Malabar cardamoms. The long cardamoms so frequently contain badly developed seed, that directions to use seed freed from the husk would give a more uniform result.

Cardui benedicti, Herba, P.G.—A more minute botanical description is now given.

Carum, U.S.P.; Fructus Carvi, P.G.—The U.S.P. gives the length of the fruit as about 4 millimetres, a measurement which applies to Dutch caraways, while the P.G. now requires the length to be 5 millimetres, which is characteristic of English caraways.

Cascarilla, U.S.P.; Cortex Cascarillæ, P.G.—The P.G. forbids the use of copalchi bark (*Croton niveus*), which it describes as occurring in larger quills, with a more strongly radiate fracture, rather more acrid taste and greater thickness. As there are several barks to which the name "copalchi" is applied it is well that the description is given, since it does not apply to the bark commonly known as "copalchi" in this country. By an oversight the length of copalchi quills is given in the old measure (1 foot) instead of in decimetres.

Cassia Fistula, U.S.P.—The description now given is sufficient to distinguish the pods from those of *Cassia moschata*.

Castanea, U.S.P.—A botanical description of the leaves is now given and it is directed that they should be gathered in September or October while still green. The drug is probably retained from the secondary list on account of its value in whooping cough. No allusion is made to the shape of the base of the leaf, which in the nearly allied species *C. americana* is rather acute.

(To be continued.)

NOTE ON THE ORIGIN OF CASSIA LIGNEA.*

BY W. T. THISELTON DYER, M.A., F.R.S.,
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The spice now known in pharmaceutical literature under the name of *Cassia lignea* has, from time immemorial, been an article of trade from South China. Flückiger and Hanbury are indeed of opinion that it was the cinnamon of the ancients, what now bears the name being peculiar to Ceylon and unnoticed as a product of the island till the thirteenth century.† Cinnamon and cassia are, however, enumerated amongst the products of the East from the earliest periods; and the former was known to the Arabians and Persians as *Darchini* (*dar*, wood or bark, and *chini*, Chinese). It seems in ancient times to have been carried by Chinese traders to the Malabar coast, where it passed into the commerce of the Red Sea. In this way the statements of Dioscorides, Ptolemy, and others, are accounted for, who speak of cinnamon as a product of Arabia and Eastern Africa, countries in which there is no reason to suppose it ever grew. At the present day it is still an important item in Chinese commerce. I find, from the Statistical Returns of the Chinese Imperial Customs (for copies of which Kew is indebted to Sir Robert Hart), that the export from China for the last two years stands as follows‡:—

	Quantity.	Value.
1880 . .	38,784 piculs,	225,692 Haikwan taels.
1881 . .	57,456 „	300,303 „

1 picul = 133⅓ lbs.; 1 Haikwan tael = 5*s.* 6½*d.*

With regard to the botanical source of Cassia lignea, it is remarkable, considering its ancient history and its present importance in trade, that up to the present time nothing certain has been ascertained. Flückiger and Hanbury remark:—"Although it is customary to refer it without hesitation to a tree named *Cinnamomum Cassia*, we find no warrant for such reference; no competent observer has visited and described the cassia-yielding districts of China proper, and brought therefrom the specimens requisite for ascertaining the botanical origin of the bark."§

Bentley and Trimen also remark, in their 'Medicinal Plants,'‖ "Though it is probable that this species (*Cinnamomum Cassia*) affords Chinese cassia, the fact has never been proved."

In the face of the uncertainty felt by these authorities, it appeared to be desirable to have the point, if possible, cleared up. The attention of the Colonial Office was accordingly drawn to the matter, November 18, 1881; and it was suggested that Mr. Charles Ford, Superintendent of the Botanical and Afforestation Department, Hong Kong, might be allowed, with the consent of his Government, to proceed to the cassia plantations on the West River for the purpose of reporting on the cultivation and collection of Cassia lignea, as well as of bringing back for distribution from the Hong Kong Botanic Garden living and dried botanical specimens of the authentic plant. Lord Kimberley was so good as to approve of the proposal; and in the month of May last Mr. Ford accordingly started for the cassia districts of the West River, the Sai Kong. He completely succeeded in the object of the expedition, and described his journey and its results in a Report to the Hong Kong Government, August 9. This Report has been printed as a Government Notification (No. 339); but as in that form its circulation will necessarily be very limited, I think the facts deserve the wider circulation which will be afforded by the Society's Journal.

Mr. Ford's journey was timed so that he might be in the districts at the season when the trees were flowering. This enabled him to obtain authentic specimens for their botanical identification, and also to witness the operation of obtaining and preparing the bark.

Mr. Ford gives the following account of the geographical position and extent of the cassia districts:—

"There are three chief districts where the cassia is cultivated, viz.:—Taiwu, in lat. 23° 34′ N., and long. 110° 18′ E. in the Kwangsi province; Lukpo, in lat. 23° 6′ N., and long. 112° 24′ E.; and Loting, in lat. 22° 52′ N., and long. 111° 8′ E., both in the Kwangtung province. These are the market towns of the district; but the cassia is cultivated over a large area of country stretching to considerable distances from the towns, the extent of which could not be ascertained owing to the unreliable accounts given by the different people questioned, who either had very vague notions of area, or were disinclined, as they usually are, to give information to foreigners.

"Taiwu is about four or five miles from the West River, and is reached by a pleasant walk leading over a plain; but the nearest cassia plantations are situated twenty-five or thirty miles further in a southern or south-westerly direction, to which there is no communication by river. Taiwu is about one hundred and eighty miles west of Canton. The Taiwu people said that the area of cultivation was not increasing.*

"The next most important, if not the *most* important (or at least tending in that direction) district is the Loting one, commencing at about eight or ten miles distant from the city of Loting. After leaving the West River about eighty miles of the Loting River—the Nam Kong—has to be traversed before reaching the city, and from there the distance to the plantations has to be accomplished overland. One of the largest cultivators said that in this district there were about 1,000,000 *maus* (about 52,600 English acres) under cultivation, and that the area was greatly extending every year. The cultivation of cassia has been carried on here for only about twenty-five years, *i.e.*, since the Tai-Ping rebellion, at which time, for the preservation of the plants and protection of them from destruction by the rebels, they were transferred from a district further south, at which it is reported the cultivation of cassia was abandoned when it was commenced at Loting.

"The next district is that of Lukpo, which is much less important than the other two. The city of Lukpo is situated on the northern bank of the West River; and the plantations are situated at about fifteen miles between the nearest one and the city.

"In addition to these places there are several small localities near the West River at intermediate places, where small patches of cassia are grown; and as the quantities of bark obtained are too small to send to market towns, it is brought off by small boats and sold to larger boats which carry produce down the river.

"About six miles south-west of the small town of To Shing, which is situated on the southern bank of the

* From the *Journal of the Linnean Society*, December 18, 1882.

† 'Pharmacographia,' pp. 520, 521.

‡ 'Returns of Trade at the Treaty Ports for the year 1881,' p. 10.

§ 'Pharmacographia,' p. 528.

‖ Vol. iii., *sub tab.* 223.

* "Near the town of Taiwu, according to Mr. Moss ('Narrative of an Exploration of the West River,' 1870), the best cassia bark is produced" (Bretschneider, 'Early European Researches into the Flora of China,' p. 13).

river, about twenty-five miles above the confluence of the Loting and West rivers, there are some plantations, from which, however, no bark has been obtained for two years and no new plantations made for ten, because the low prices which can now be obtained for the bark do not leave any profit to the producers. This was the only instance which came to my knowledge of the decrease of the trade in the cassia production, although it is said that the Java cassia trade, in consequence of the lower prices at which the cassia can there be produced, is cutting out and crippling the China trade."

From each of the districts of Taiwu, Lukpo and Loting, Mr. Ford obtained and sent to Kew copious and excellent specimens. These have been examined by my colleague, Professor Oliver, who informs me that they certainly all belong to the same species, and that this is undoubtedly *Cinnamomum Cassia*, Blume. Mr. Ford took great pains to ascertain if this was the exclusive source of Cassia lignea. He reports:—

"This is the *only* tree from which cassia bark, 'buds,' or leaves of commerce in China, so far as could be ascertained from personal inspection and reports, are obtained. All the trees seen in the districts of Taiwu, Loting and Lukpo, and intermediate localities where cassia was grown in smaller quantities, were of this species, nor were there, apparently, distinct varieties of the species in cultivation. The cultivators and other natives were much interrogated as to whether they knew or had heard of any other tree which yielded the products under notice, and the invariable reply was that there was no other kind. There is, therefore, I think, no doubt but writers who have named other kinds as cassia-yielding trees of China have been mistaken or misinformed on the subject. One writer alludes to a tree in terms which partly correspond to the description of *Machilus velutina*, Champ., another tree belonging to Lauraceæ, and indigenous to South China. It is quite possible that this tree may have been supposed by a casual observer to yield cassia bark, because it is sometimes grown in plantations intermixed with those of *Cinnamomum Cassia*. The trees are reared, planted, and treated in precisely the same manner as the cassia trees; but the bark is required for a very different use, viz., to supply a glutinous extract which is used to stick together powdered cassia bark and sandal wood (*Santalum album*) to form the joss-sticks used for incense. *Cinnamomum Burmanni*, Bl., which it has been supposed may probably yield 'in part the cassia bark of the Canton market,' does not, I feel sure, supply cassia bark to any extent. I did not see it anywhere cultivated; nor was it seen growing wild in any but very small quantities, and these wild trees bore no signs of having been cut as had the cassia trees: many natives were asked if it was ever used; but, with one exception, all denied that it afforded any cassia bark. The one exception was an old woman, who was cultivating a field of Indian corn close to a few small trees of *Cinnamomum Burmanni*, and who said that its bark was sometimes, but rarely, used to adulterate the true cassia bark."

Mr. Ford on his return journey paid a visit to the well-known Chinese botanist, Dr. Hance, H.M. Vice-Consul at Whampoa, who identified the specimens of the Cassia lignea tree collected by Mr. Ford as belonging to *Cinnamomum Cassia*. There is, in fact, in the Kew Herbarium a specimen of the same species collected by Dr. Hance in 1876; but I have searched in vain to see if Dr. Hance has published any thing about it, and the specimen bears no note that it is the source of Cassia lignea. This specimen is the material upon which the plate given by Bentley and Trimen is based, and represents no doubt the true plant.

Cinnamomum Cassia was first described by Blume, in 1825.* The species was apparently founded on cultivated specimens from Java, where Blume states it was "ex China introductum."

The Kew Herbarium possesses a cultivated Java specimen contributed by the Leyden Herbarium. This is no doubt an authentic type of the plant described by Blume; and Professor Oliver finds that it agrees precisely with the plant collected by Mr. Ford on the West River. It may be, therefore, considered finally settled on the one hand, that the Chinese Cassia lignea plant is really the *Cinnamomum Cassia*, Blume, and, on the other hand, that the plant cultivated in Java is identical with that now known to be the source of the spice in China.

It is remarkable that though the cultivation of the Cassia lignea tree has apparently been carried on in Southern China from time immemorial, it does not appear to be indigenous there.* In Cochin-China, however, there appears to be some probability of its being really wild. *Cinnamomum Cassia* is, botanically, very closely allied to *C. obtusifolium*, Nees, one of the species from which a similar product is obtained on the Khasia hills.

It only remains to give Mr. Ford's account of the mode of collecting and preparing the bark. He obtained and sent to this country a set of the implements, which are deposited in the Kew Museum.

"*Bark.*—When the trees are about six years old, the first cut of bark is obtained. The season for barking commences in March and continues until the end of May, after which the natives say the bark loses it aroma, and is therefore not removed from the trees. The branches, which are about an inch thick, being cut to within a few inches of the ground, are carried to houses or sheds in the vicinity of the plantations. All the small twigs and leaves being cleared off, a large-bladed knife, with the cutting-edge something like the end of a budding knife, is used to make two longitudinal slits and three or four incisions, at sixteen inches apart, round the circumference through the bark; the bark is then loosened by passing underneath it a kind of slightly curved horn knife with the two edges slightly sharpened. Pieces of bark sixteen inches long and half the circumference are thus obtained.

"The bark, after its removal and while it is still moist with sap, is then laid with the concave side downwards, and a small plane passed over it, and the epidermis removed. After this operation the bark is left to dry for about twenty-four hours, and then tied up in bundles about eighteen inches in diameter, and sent into the merchants' houses in the market towns.

"*Leaves.*—The leaves which are cleared from the branches that are barked are carefully preserved and dried, and afford by distillation cassia oil. A large number of leaves are sent to Canton, where I was told the operation of distilling is performed.

"*Twigs.*—These are removed from the cut branches at the same time as when the leaves are obtained. They are a marketable commodity for native uses.

"*Buds.*—Cassia-buds are the immature fruits. They are gathered when about one-eighth grown. Buds, and the seeds which are annually required for sowing, are obtained from the trees ten years and upwards of age that are left standing at about fifty and a hundred feet apart amongst the trees which are cut down every six years for their bark. These seed-bearing trees are not cut unless there is a demand for the very thick bark on their trunks, when some of the trees which can be conveniently spared are sacrificed."

* 'Bijdragen Fl. Nederl. Indië,' ii., p. 570.

* The earliest printed notice in works professing to give botanical information about China appears to be in Martini's 'Atlas Sinensis' (1655). See Bretschneider's 'Early European Researches into the Flora of China,' p. 13.

TURPENTINE: ITS NATURE AND ADULTERATIONS.†

BY PROFESSOR HENRY E. ARMSTRONG, PH.D., F.R.S.

In the course of investigations on the terpenes, camphor and allied compounds, in which I have been engaged during several years past, the opportunity has occurred

† From the *Journal of the Society of Chemical Industry*, December 29, 1882.

of gradually collecting a number of data which probably are of sufficient technical value to find a place in the *Journal of the Society of Chemical Industry*.

Thanks to the kindness of my friend, Mr. E. Phillips, of Messrs. Ingall, Phillips and Co., I was enabled to examine average samples of most of the cargoes of turpentine landed by his firm during the years 1877 to 1880, and thus to obtain a clear insight into the character of the commercial article. The high price of turpentine during the past few seasons has undoubtedly led dealers here to adulterate it, and it was to be feared that shippers might not uniformly resist temptation; therefore, at the request of the above-mentioned firm, since the beginning of last year, I have regularly tested all cargoes landed at their wharves.

The crude resinous exudation, formerly known as "turpentine," is no longer an article of commerce in this country, the obviously rational course being nowadays adopted of separating it into its constituents, "spirit of turpentine," or "turpentine oil" and rosin. On this account the name "turpentine"—*vulgare* "turps"—is now commonly employed as synonymous with the longer appellation, spirits or oil of turpentine, and it is in this sense that the term is employed in the paper.

The commercial varieties of turpentine mainly consist of hydrocarbons of the formula $C_{10}H_{16}$, of which certainly *three* distinct classes may be distinguished, viz., *terpenes*, *citrenes*, and a third of which *sylvestrene*, the characteristic constituent of Russian turpentine, is the type. Under *terpenes*, I include those varieties which boil at about 156° C.; under *citrenes*, those which boil at about 176° to 178°, such as are the chief constituents of the oils derived from various species of *citrus*.

French Turpentine.—It is generally stated that French turpentine is the produce of a single species of conifer, *Pinus maritima*. It certainly is of remarkably uniform quality, judging from the almost constant rotatory power of samples which I have had occasion to examine at various times, and probably the properties of the terpene of which the French oil mainly consists are not very different from those of the commercial article. Using any form of polarimeter which admits of the observation being made in monochromatic light—it is, perhaps, well to note that the Soleil form cannot be employed for the examination of turpentine—and operating with a 200 mm. column, the value of α_D is on the average about $-60°$ to $-61°$.

American Turpentine.—American turpentine is said by Hanbury and Flückiger ('Pharmacographia,' 1st ed.) to be chiefly the produce of the swamp pine (*Pinus Australis*), this and the loblolly pine (*Pinus tæda*) being, they say, the most important sources of turpentine.

The following particulars regarding the separation of the hydrocarbon from the crude resinous exudation will probably be of interest. I am indebted for them to Dr. Thomas F. Wood, of Wilmington, N.C.; they were written at the request of Mr. Charles Rice, American editor of the 'Pharmacographia':—

"Turpentine is distilled in copper stills now. Formerly iron stills were used. All crude turpentine is distilled with water. A fifteen-barrel still (barrel weighs 280 lbs.) is charged early in the morning. Gentle heat is first applied until the mass is liquefied, and a coarse wire skimmer is used to remove the chips, bark, leaves and such other foreign substances as rise to the surface, the temperature meanwhile rising until 316° F. is reached. All the accidental water (that contained in the crude turpentine as it comes from the forest) having been distilled off, a small stream of cold water is now let in, so that the heat is kept at or below 316° F., the boiling point of oil of turpentine. The oil of turpentine and water now come over, and the mixture is caught in a wooden tub. The distiller tests the quality of the flow from time to time in a proof-glass, and the distillation is continued until the proportion of water coming over is 9 of water to 1 of oil of turpentine. At this stage the heat is withdrawn, the still-cap is taken off, and the hot rosin is drawn off by a valvular cock at the side of the still near the bottom. This rosin passes through a strainer before it reaches the vat, to rid it of foreign substances which may not have been previously removed by the skimmer. The yield of oil of turpentine from 'virgin dip' (the first exudation from a newly-boxed tree) is about 5 gallons to the barrel, about 20 per cent. being left in the rosin,* since the removal of a larger proportion would darken the colour, and consequently depreciate its value. The yield from 'yellow dip' (the runnings of the second and subsequent years) is about 4 gallons to a barrel. The yield from 'scrapings' (the inspissated gum from the tree facings) is about 2 to $3\frac{1}{2}$ gallons according to age, and also to the proportion of trash which it contains."

The separation of turpentine, by what is practically a steam distillation process, serves to explain the fact which, until I received the above information, had often surprised me, that the commercial article is uniformly free from products of the decomposition of rosin by heat.

Some idea of the importance of the turpentine industry will be gathered by inspection of the following table, representing the number of barrels imported into London since 1872:—

1873	44,495	1878	56,221
1874	57,720	1879	42,960
1875	57,093	1880	39,649
1876	57,371	1881	63,724
1877	49,500	1882	57,489

Probably about two-thirds of the entire quantity sent to this country is landed in London.

In so far as general properties are concerned, there is no practically distinguishable difference, other than in colour, I believe, between various samples of the commercial article, but tested by the polarimeter they vary considerably.

The chief port of shipment is Wilmington, and most of the turpentine from this port, like that from Bordeaux, is of remarkably uniform quality. Thus out of thirty-five samples, representing in all cases bulks of several hundred barrels, and in a number of cases bulks of from 1000 to 2000 or more barrels, no less than twenty-eight samples varied in rotatory power (value of α_D per 200 mm.), only within the very narrow limits of 27° 6′ to 28° 35′; four samples had an inferior rotatory power of 24° 29′ to 26° 40′, and only three had a superior rotatory power of respectively 29° 31′, 31° 21′, and 32° 38′.

That shipped from Savannah, on the other hand, is, as a rule, characterized by a relatively low rotatory power, *e.g.*:—

Ex. 1569 brls.	$\alpha = 22° 21′$	Ex. 1696 brls.	$\alpha_D = 19°$
Ex. 1000 „	$\alpha^b = 24° 9′$	Ex. 1870 „	$\alpha_D = 20° 33′$
Ex. 1383 „	$\alpha^b_D = 20° 22′$	Ex. 1200 „	$\alpha_D = 21° 21′$
Ex. 1571 „	$\alpha_D = 19° 39′$	Ex. 1595 „	$\alpha_D = 19° 12′$

In the case of the last of these shipments, I had the opportunity of taking five samples, each representing about one-sixth of the bulk, which gave the following values:—21° 4′, 21° 19′, 18° 13′, 17° 38′, and 20° 6′. I have not been able to ascertain whether the turpentine shipped from Savannah is the produce of a different tree, or whether the difference in climate between the two districts, of which Wilmington and Savannah are "centres," is the cause of the marked variation from what may be termed the Wilmington type. I trust that the publication of this paper may, as one result, lead to my being favoured with information on this point.

Judging from the opportunities which have presented themselves for examining turpentine shipped from Charleston, the deliveries from this port would appear

* The fact that the whole of the hydrocarbon is not removed accounts for the statement sometimes made, that "rosin spirit" is optically active, that made from pure rosin, according to my experiments, being inactive.

to comprise turpentine of somewhat high rotatory power, as well as those of the Wilmington and Savannah types:—

Ex. 1000 brls.	$\alpha_b = 30° 24'$	Ex. —— brls.	$\alpha_b = 19°$
—— „	$\alpha_b = 30° 38'$	Ex. 1874 „	$\alpha_b = 26° 42'$
Ex. 250 „	$\alpha_b = 33° 33'$	Ex. 1886 „	$\alpha_b = 29° 39'$
Ex. 1689 „	$\alpha_b = 28° 15'$	Ex. 200 „	$\alpha_b = 24°$
Ex. 2179 „	$\alpha_b = 24° 15'$		

Other parts also furnish a somewhat irregular product; the values, however, always lie within those already given, and in the majority of cases belong to the Wilmington type, Brunswick alone exhibiting a marked tendency to furnish a product of the Savannah type.

Commercially, I believe, no distinction is made between the turpentine shipped from various American ports; nor indeed is French turpentine, which is now a comparative rarity in the English market, regarded as having distinctive qualities. My observations on the whole justify this practice: French turpentine is slightly less readily oxidized, absorbing oxygen somewhat less rapidly than American turpentine, but the difference is probably insufficient to make itself felt in practice.

Russian Turpentine.—Commercially this variety is of no importance, as it cannot well be used in paint or varnish making, both on account of its unpleasant odour and of the extreme readiness in comparison with French or American turpentine with which it absorbs oxygen, forming a viscid oil; its vapour appears also to produce far more marked physiological effects than either of the ordinary oils, inciting violent headache in many individuals. It is the produce of *Pinus sylvestris*, but I have not been able to ascertain whether the turpentine is specially collected, or is a mere bye-product. According to one account which I have received, the waste timber is piled into heaps and a fire lighted; the resinous matter which drains away is then collected and the turpentine extracted from it by distillation.

Different samples are remarkably different in their optical character, as the following numbers show:—

α_b(per 200 mm.) =	36° 29′	44° 11′	40° 42′
	36° 7′	41° 0′	46° 45′
	34° 18′	35° 28′	36° 4′
	38° 58′	30° 42′	37° 5′
	32° 27′	35° 20′	42° 10′
	31° 20′	38° 6′	39° 52′
	34° 8′	45° 10′	30° 10′
	39° 58′	38° 4′	

Excepting the first four, all these samples were drawn from single barrels, and were obligingly furnished to me by Mr. Kingzett.

Russian turpentine has been shown by Tilden (*Chem. Soc. Trans.*, 1878–80) to consist of a peculiar $C_{10}H_{16}$ hydrocarbon, the so-called *Sylvestrene* of Atterberg (*Ber.*, 10, 1202), and of an isomeride possessing the character of American turpentine. Sylvestrene, according to these authors, has a *specific* rotatory power of $(\alpha_o) = 19{\cdot}5°$ (Atterberg), 19·6° (Tilden), that of the associated hydrocarbon being 36·3° (Atterberg). In confirmation of the assumption that one of the constituents of Russian turpentine is probably identical with the main constituent of American turpentine, I may mention that I have separated from the latter by fractional distillation a portion having a rotatory power per 200 mm. of no less than 49° 34′, and that on several occasions, by submitting American turpentine to air oxidation, and afterwards distilling off the unaltered hydrocarbon by steam, I have obtained products of considerably higher rotatory power than the original oils. I have also examined several samples received from Mr. Kingzett of the hydrocarbon carried over by the air current during the air oxidation of Russian turpentine. In most cases these have been almost free from sylvestrene, and have exhibited a higher rotatory power than the original crude turpentine from which they were derived.

The numbers above given fluctuate within wide limits, and are of interest as indicating that the proportions in which the two recognized constituents of Russian turpentine are present probably vary considerably, and also that other perhaps isomeric hydrocarbons are mixed with them; they serve to confirm the idea that American turpentine is also a mixture of isomeric hydrocarbons. I may add that certain observations even lead me to think it not unlikely that the low dextrorotatory power of American turpentine is due to the presence of a lævorotatory terpene; this would serve to explain the difference in optical character of products from different localities. The comparative study of American turpentine—and indeed generally of oils containing $C_{10}H_{16}$ hydrocarbons—from this point of view, I think deserves attention; variations in climatic and other conditions may have led to a gradual differentiation both in botanical and physiological character of a single parent stock.

Method of Analysis.—The terms "petroleum spirit" and "petroleum oil" as commercially used do not admit of very precise definition; for the purpose of this paper, I would therefore define petroleum spirit as being that portion of crude petroleum which may be volatilized by means of steam from water boiling at atmospheric pressure, and petroleum oil as being the non-volatile portion. Judged of by this definition, commercial spirit and oil are, as a rule, more or less mixtures; the amount of spirit in the best burning oils is, however, small.

The presence of petroleum oil in turpentine is readily detected and the amount estimated by steam distilling. Unless it has been freely exposed to the air for a long time, but a mere trace of viscid matter remains on steam-distilling turpentine; on one or two occasions only have I met with samples containing a small amount of rosin, which was left as a solid on distilling off the turpentine by a steam current. Should more than a few tenths of a per cent. of non-volatile matter remain, it is probable that petroleum is present. This usually betrays itself by the more or less marked blue fluorescence of the residue; but should this criterion fail, the behaviour of petroleum and of the non-volatile product of the air oxidation of turpentine on digestion with dilute nitric acid will serve to differentiate them. The latter is readily oxidized and dissolved; the former does not alter much in bulk, but apparently undergoes more or less complete nitration. I have never yet met with a sample containing rosin oil, but it would not be difficult to detect it, as it is oxidized by nitric acid, and behaves in a most characteristic manner when triturated with a paste of slaked lime, forming the well-known grease.

The detection and estimation of petroleum spirit is less readily effected. The method which I employ is based on the different behaviour of turpentine and paraffins with sulphuric acid. The paraffins, it is well known, are almost unaffected, whereas turpentine is polymerized and for the most part converted into substances of high boiling point which do not volatilize in a current of steam. I say for the most part, because, as I have elsewhere stated, a certain amount of cymene and of a paraffinoid hydrocarbon is always produced. Inasmuch as the amount of cymene so produced varies with the strength of the acid and the temperature, being larger the more concentrated the acid and the higher the temperature, it is important always to work under uniform conditions, at as low a temperature as convenient, and to use diluted acid. I employ two strengths of acid, a mixture of 2 vols. acid and 1 vol. water (2:1 acid) and a mixture of 4 vols. acid and 1 vol. water (4:1 acid). The turpentine—500 c.c. is a convenient quantity—is placed with about one-fourth to one-third of its bulk of 2:1 acid in a well-stoppered bottle, and the mixture is somewhat cautiously agitated. It soon becomes more or less heated, and as it is important to effect the polymerization at a temperature not much above the ordinary atmospheric temperature, the bottle is placed in cold water for a short time. After repeated agitation with the acid, the turpentine is converted into a viscid oil, and when this is the case and no more heat is developed on

continued agitation, the contents of the bottle is transferred to a separating funnel, the acid layer is run off and the oil poured into a flask; the latter having been connected with a condenser and a steam-pot—an ordinary tin can answers admirably—all that is volatile is distilled off. The distillate is mixed with about half its bulk of 4:1 acid, and treated in a precisely similar manner.

The product from this second operation should only consist of a mixture of cymene and the paraffinoid hydrocarbon; in bulk it should not be more than 4 to 5 per cent. of the original hydrocarbon. This is the result of a very large number of estimations; as little as 3 per cent., however, has been obtained in experiments conducted with special care. If much more than about 5 per cent. be obtained, it is desirable to repeat the treatment with 4:1 acid.

If, from the result of this treatment, it appears probable that petroleum spirit is present, the product is placed in a well-stoppered bottle, together with several times its volume of concentrated sulphuric acid, heated to 50° to 60°, with which it is violently agitated. This treatment is repeated if desirable (weak Nordhausen acid being with advantage substituted for the concentrated sulphuric acid), and the residual hydrocarbon is separated, steam distilled, and then measured. The amount thus obtained should not exceed from ½ to 1 per cent. of the original bulk of turpentine. This treatment with concentrated acid affords a check on the previous determination.

If American petroleum spirit be thus treated it suffers comparatively little loss, so that the amount of hydrocarbon above 1 per cent. represents the *minimum* amount of petroleum spirit in the turpentine. The spirit from Scotch petroleum contains a very much higher proportion of hydrocarbons alterable by sulphuric acid, and therefore cannot be satisfactorily estimated.

To confirm the presence of petroleum spirit, the turpentine should be distilled. Petroleum spirit commences to distil at a temperature which may be above or below that at which turpentine boils, according to its quality, but always distils within comparatively wide limits of temperature; turpentine commences to boil near 160°, and almost entirely passes over below 180°.

The presence of rosin spirit also affects the boiling point in a similar manner. Evidence of the presence of this adulterant is also afforded by the increased yield of hydrocarbons on treatment both with 4:1 and concentrated sulphuric acid, as rosin spirit also yields a cymene and paraffinoid hydrocarbon on treatment with 4:1 acid. The cymene from rosin spirit being isomeric with that from turpentine, proof of the presence of rosin spirit can be obtained by the detection of its cymene, but this is a somewhat delicate operation.

Addendum.—The method above described is also available for the analysis of solvent naphtha from coal tar and similar products; it is, in fact, the only method which is capable of affording results which approach exactness. The problem is by no means so simple, however, as the coal tar product itself contains, besides benzene and its homologues, basic bodies, hydrocarbons alterable by diluted sulphuric acid, and paraffins. Until, therefore, a considerable number of genuine samples have been examined, the method is chiefly of value as a qualitative test.

THE FIG TREE.*

During a lengthened stay in Naples and attendance at the Zoological station of that city, Count H. zu Solms-Laubach, assisted by Dr. P. Mayer, one of the staff of the institute, and by Baron Valiante, made a special study of the origin, domestication and cultivation of the fig-tree (*Ficus carica*, L.), the result of which he has published in the form of a pamphlet, 'Die Herkunft, Domestikation, und Verbreitung des gewöhnlichen Feigenbaum, Von H. Grafen zu Solms-Laubach. Göttingen, 1882.' The work is especially devoted to the study of the history of the fig-tree, and the operation of caprification, which, as is known, consists of hanging the fruit of the wild fig upon the cultivated tree, receives considerable attention. Perhaps it will be as well to mention here, for the benefit of some less acquainted with the subject, that the fruit of the wild fig is hung upon the cultivated tree by gardeners, in order that the insect which lives in the wild may enter the cultivated fruit, which they think results in preventing the figs from falling off, hastens their maturity, and improves their taste. Count Solms-Laubach begins by mentioning that already in ancient times two distinct varieties of fig-trees were clearly distinguished, the fruit of the first of which is sweet, succulent and eatable, that of the other remaining hard and milky until it attains a very imperfect maturity, without the least formation of sugar, and then quickly dries up. Count Solms-Laubach distinguishes the first species by the name of fig-tree, the other by the name of caprificus, or as it is called in the Neapolitan dialect, "profico." The caprificus (or wild fig-tree) usually bears fruit thrice, the cultivated fig-tree twice a year. The caprificus in the interior of its figs has both male and female flowers; the fig-tree usually only female. It is the female flowers of the caprificus fig which contain the insects that serve for the operation of caprification. Both the caprificus and the fig-tree are obtained from sowing the seed of the cultivated fig; but as the quality in such cases is generally very bad, propagation is exclusively carried on by shoots. The curious insects developed in the caprificus flowers, and called *Cynips Psenes* by Linnæus, but now named *Blastophaga grossorum*, were already known to the ancients as a means of caprification. These insects belong to the order of Hymenoptera. The females are winged, the males wingless. In Naples, where the author made the greater part of his studies, the wild figs produced at different seasons of the year are respectively named "mamme," "profichi," and "mammoni;" and it is from the first of these, the so-called mamme (which are the earliest harvest of the caprificus and ripen in April), that the insects which have wintered therein issue in spring in order to lay their eggs in the fruit of the second harvest, the so-called profichi, which ripen in June. When this has taken place—a very few insects, thanks to their great productiveness, are able to fill numerous flowers with their eggs—the mother insects die; in May the larvæ, and in June the perfect insects are formed, and meanwhile the fruit of the third harvest, the so-called mammoni, which ripen in August and September, are ready to receive the female Blastophagæ. From these mammoni, finally, the brood wanders into the mamme in order to winter, and thus the chain of events is completed, and in the following spring the laying of eggs in profichi is recommenced. Let us now see what happens when the female Blastophagæ, instead of entering the figs of the caprificus, lay their eggs in those of the cultivated fig-tree. The insects, indeed, perform the operation, but are unable to lay their eggs in the proper place (for reasons shown in the pamphlet, but too detailed to be mentioned here), and the progeny, therefore, never develops. Nevertheless the entrance of the insects has a most important influence; they carry with them into the fig with exclusively female flowers the pollen of the male caprificus flowers, and thus cause the formation of seed. Our author describes the Blastophaga as a small black insect issuing between the scales of the ripe fruit in June. Having arrived outside, it suns and dries its wings, and cleans its hairy body with its feet to rid itself of the pollen which adheres to it so thickly that it looks as if powdered. If one opens a wild fig at the proper time, a large number of these insects are seen running about, evidently seeking to escape. The wingless and

* From the *Daily News*.

helpless males are distinguished by a bright amber colour. When the insects pentrate the figs of the young profichi to lay their eggs, they frequently lose their wings, so great is the effort needed. Count Solms-Laubach often found whole bunches of torn-off wings, where many females had entered the same figs. They generally die after laying their eggs, while seeking their way out. Opinions are divided as to the efficacy of caprification. By some it is considered advantageous, while others regard it as injurious. Count Solms-Laubach gives his verdict as follows:—"Caprification is an operation, traditionally preserved from generation to generation in the same form, which, once necessary, is now scarcely useful, but the scientific importance of which as a means of determining the changes experienced by our cultivated plants in the course of years, cannot be too highly valued."

After deciding the geographical extent of the cultivation of the fig-tree, the author calls attention to the curious fact that caprification is not always practised where the insect is found. In Greece and its islands, in Sicily and Naples, in Southern Spain and Portugal, in North Africa and Syria, and Asia Minor, it is generally introduced; but is not practised in middle and North Italy, the Tyrol, Sardinia, Corsica, the South of France, Northern Spain, the Canaries and Azores, nor in Egypt. Fossil remains prove that the *Ficus carica* was spread over the whole Western portion of our present civilized world in pre-historic times, and that it existed also in Greece and in Asia Minor cannot be doubted, in spite of insufficient proof. In France the quaternary district in which it existed exceeded in extent the present district of cultivation. The author believes, with Lloyd, that the fig-tree had died out in the whole of the Western world, and was only reintroduced in the progress of civilization. He finds the different species so similar that a common origin cannot be doubted. Western Asia and North Africa are named as the fatherland of this origin, but without sufficient proof. The author comes to the conclusion that the fig-tree had an equatorial fatherland, in contrast to the circumpolar fatherland of the vine, and finds the most favourable conditions for such an origin in the Punjaub, Beluchistan, and South Persia, as well as in the border terraces of Abyssinia. From the circumstance that probably the invention of caprification will have gone hand-in-hand with the domestication of the fig-tree, and that the former operation is carried on now exactly as it was in ancient times, and also because the nation which invented caprification must have been tolerably far advanced in civilization, the author believes that the cultivation of the fig-tree commenced at a single point, and thence spread to the rest of the world. To which nation, then, do we owe it? It is proved by ancient authors that the domestication of the fig-tree was known in Greece in the ninth century, B.C. The Bible, and especially the Semitic name of "ti'n," a word belonging to the dialect of the Bahrâ race, leads us to Arabia as the mother-land of domestication and thence probably it spread to the Semitic peoples of Syria. These commercial nations having once possessed the tree, it was natural that its cultivation should spread. The Greeks will have received it from the Phœnicians, as probably also will North Africa, Southern Portugal and Spain, Sicily and Malta; and many facts speak for such a direct introduction. In Italy we find the curious circumstance that caprification is practised in the south, but not in the north. The contrast was so great that even in the eighteenth century the North Italians were not aware that their southern countrymen made use of caprification. Count Solms-Laubach comes to the very interesting conclusion that the Romans received the fig-tree direct from the Phœnicians (of which the name *Ficus* is cited as a proof), but only the tree and not the practice of caprification was known to the Semitic races; while caprification was independently introduced into South Italy by the colonizing Greeks. The last chapter of the pamphlet is devoted to a short study on the sycamore (*Sycamorus antiquorum*, Miq.), to which the author's attention was drawn by the many analogies between that tree (in the fruit of which similar insects are found) and the fig-tree.

VEGETABLE SUBSTITUTE FOR RENNET.*

BY SIR J. D. HOOKER.

Mr. Stormont, Superintendent of the Government Farm, Khandesh, reported, May 10, 1880:—"Cheese-making is a branch of agricultural industry altogether unknown in this district, and but imperfectly understood in any part of India; yet there seems no reason why it should not be successfully practised."

Commissioner E. P. Robertson, minuted upon this, June 10, "Cheese to be saleable amongst the natives of this country should be made with some vegetable rennet. Natives would not touch cheese made with ordinary rennet, and I am convinced that good cheese cannot be made without the use of some rennet. If a good vegetable rennet could be procured the curd cheeses could be made; they would be cheap, and ryots would soon find a ready sale for them."

These facts having attracted my attention I consulted Mr. A. H. Church, formerly Professor of Chemistry in the Royal Agricultural College, Cirencester, but who has taken up his residence at Kew, and is now Professor of Chemistry to the Royal Academy. This gentleman very kindly made some experiments on curdling milk, with calcium chloride and with vegetable acids. He arrived at the conclusion, however, that though in the laboratory good results could be obtained they depended too closely on careful attention to the conditions of the process to afford a workable method for everyday use in India. Meanwhile, I had turned my attention to some suitable vegetable "rennet." Surgeon-Major Aitchison, while engaged at Kew, in working up his Afghan collections, under instructions from the Government of India, suggested a well-known North-West Indian plant (*Puneeria coagulans*), as possessing the desired qualities.

The plant in question is one of the best-known plants in Sciude, Beluchistan and Afghanistan. "It bears the name of Puneer-bund (cheese-maker), from its being used by the Beloochies and Afghans in making cheese (puneer) as a substitute for rennet."

I communicated this information to the India Office. As will be seen from the following extract from Mr. Stormont's report for 1881, the suggestion was immediately acted upon with very gratifying success.

"During the year a good deal of attention has been devoted to dairy experiments, especially the making of cheese after the practice of Italy and Switzerland. The Commissioner, C. D., pointed out that, before cheese-making can ever become an industry of the ryots, some vegetable substance must necessarily be found to take the place of the animal rennet used in European countries.

"In connection with this difficulty, Surgeon-Major Aitchison brought to the notice of the authorities at Kew that the fruit of *Puneeria coagulans*, a shrub common in Afghanistan and Northern India, possesses the property of coagulating milk.

"A quantity of the dried capsules of this plant was accordingly obtained, and part of it tried here, and found to be most suitable for the purpose. Being a member of the poisonous nightshade family, its safety was in the first place carefully and gradually tested. It has been ascertained that an ounce of the pounded capsules in a quart of water is a very suitable strength for use; a tablespoonful of this decoction coagulates a gallon of warm milk in about half an hour. Seeds of the plant sown have germinated freely, and their further progress will be specially reported upon."

* From the 'Report on the Royal Gardens at Kew.'

The anxiety as to the botanical position of *Puneeria* amongst the *Solanaceæ* has, I think, no solid foundation. The genus *Puneeria* is now reduced by botanists to *Withania*. This is a member of the tribe *Solaneæ*, which appears to be generally free from the poisonous principles so characteristic of *Atropeæ* and *Hyoscyameæ*. It abounds, in fact, in plants producing fruits which daily experience shows to be innocuous, such as the tomato, aubergine, capsicum, *Cyphomandra* and cape gooseberry.

THE DILUTION AND MIXTURE OF ACIDS, ALCOHOL, SOLUTIONS OF SALTS, ETC.*

BY TH. J. WRAMPELMEIER, PH.C.

There have appeared, at different times, rules and formulæ for the dilution of alcohol and acids. Some of them are very simple for particular cases, but are either not applicable to the more complicated cases, or, in their application, involve more or less tedious algebraic operations. I do not remember having seen any rule that is so simple or of so nearly universal application as the one I have used for some time, and which I will give below.

I started with the following consideration. It is evident that, if we mix 100 grams of 75 per cent. (by weight) alcohol with 100 grams of 25 per cent. (by weight) alcohol, the product will be 200 grams of 50 per cent. alcohol, because the first 100 grams contain 75 grams absolute alcohol, and the second 100 grams contain 25 grams—total 100 grams in the mixture whose weight is 200 grams, *i.e.*, 50 per cent. Now the 100 grams 75 per cent. alcohol contain 25 grams more absolute alcohol than is necessary to make it a 50 per cent. alcohol, whereas the 100 grams 25 per cent. alcohol *lack* 25 grams absolute alcohol of being the strength 50 per cent. Suppose we are to make 50 per cent. alcohol out of both the 75 per cent. and 25 per cent. alcohols, we add enough of the 75 per cent. alcohol to the 25 per cent. alcohol, so that the excess over 50 per cent. of the former is just sufficient to make up the deficiency below 50 per cent. of the latter, or *vice versâ*. Accordingly, in mixing two alcohols of different per cent. strength to make one of intermediate strength, the *excess* of absolute alcohol in the one (over what is necessary to make it the desired strength) must be equal to the *deficiency* of absolute alcohol in the other. Let

P = per cent. strength (by weight) of the stronger.
p = per cent. strength (by weight) of the weaker.
W = weight of stronger.
w = weight of weaker.

Then $P \times W$ = amount of absolute alcohol in the stronger alcohol, and $(P - p')\,W$ = excess of absolute alcohol above what is required to make it strength p′. Similarly $(p' - p)\,w$ = deficiency of absolute alcohol in the weaker alcohol (below what is necessary to make it strength p′). To make the mixture strength p′, we must mix them, so that $(P - p')\,W = (p' - p)w$, from which we get the proportion—

$$(P = p') : (p' - p) : : w : W,$$

and our rule which is as follows:—

Having two solutions of the same substance and different per cent. strength (by weight) to make a solution of intermediate strength, mix them in the inverse proportion of the differences between their percentage strength and the percentage strength of the required mixture.

Or, having two solutions strength P (for the stronger) and p (for the weaker) to make one of intermediate strength, p′, mix them in the proportion of p′ - p of the stronger to P − p′ of the weaker.

When, instead of the weaker solution, water is to be used, as in the dilution of alcohol or acids, p becomes zero, and the proportion becomes p′ of the solution to P − p′ of water. The following cases may arise:—

(1) Given the weight of the stronger, how much of the weaker will be required to make the mixture of the required intermediate strength? The proportion is—
p′ = p : P − p′ : : W : x = weight required, or if, instead of the weaker solution, water is to be used,

p′ : P − p′ : : W : x = weight of water required.

Example.—Having 100 kilos nitric acid, strength 70 per cent., how much nitric acid, strength 10 per cent., must be added to this to make an acid strength 50 per cent.?

$$(50 - 10) : (70 - 50) : : 100 : x.$$

x = 50 kilos = weight of 10 per cent. acid required.

If water is to be used instead of the 10 per cent. acid,

$$50 : (70 - 50) : : 100 : x.$$

x = 40 kilos = weight of water required.

(2) Given the weight of the weaker, how much of the stronger will be required? The proportion is—

$$(P - p') : (p' - p) : : w : x.$$

x = weight of stronger required.

Example.—Having 100 lbs. alcohol, strength 23 per cent. (by weight) to make 45 per cent. alcohol, how much 93 per cent. alcohol will be required?

$$(93 - 45) : (45 - 23) : : 100 : x.$$

x = 45·8 lbs. = weight of 93 per cent. alcohol required.

(3) It is desired to make a certain quantity of the solution of intermediate strength, how much of each the stronger and the weaker will be required?

Let a = weight of alcohol (strength p′) to be made,
and x = weight of stronger alcohol (strength P) required,
then a − x = weight of weaker alcohol (strength p) required.

We have $(P - p') : (p' - p) : : a - x : x$;
from which $(P - p) : (p' - p) : : a : x$.

x = weight of stronger solution required.
a − x = weight of weaker solution required.

Example.—To make 10 kilos of alcohol, strength 85 per cent. (by weight), how much of each 91 per cent. and 45·5 por cent. alcohol is required?

$$(91 - 45{\cdot}5) : (82 - 45{\cdot}5) : : 10 : x.$$

x = 8·7 kilos = weight of 91 per cent. alcohol required.
10 − 8·7 = 1·3 kilos = weight of 45·5 per cent. alcohol required.

If water is to be used instead of the 45·5 per cent. alcohol, p becomes zero, and we have —

91 : 85 : : 10 : x = 9·34 kilos 91 per cent. alcohol.
10 − 9·34 = 0·66 kilos water required.

(4) Again, we may have three or more solutions which we desire to mix, in order to obtain a solution of certain strength, as, for instance, it may be desirable to use up several lots of recovered alcohol in the preparation of an alcohol of certain strength. It is evident that a sufficient quantity of the strongest alcohol or alcohols must be used, so that the excess of absolute alcohol above the required per cent. will equal the sum of the deficiencies of absolute alcohol of the weaker alcohols.

Let P = per cent. strength of strongest alcohol.
W = its weight.
p′ = per cent. of required alcohol.
p″ = per cent. of a weaker alcohol.
w = its weight.
p = per cent. of the weakest alcohol.
w′ = its weight

Then $(P - p')\,W = (p' - p'')\,w + (p' - p)\,w'$.

Example.—(*a*) You have 10 kilos alcohol strength 10 per cent. (by weight) which you desire to bring up to 50 per cent., using therefore 2 kilos of 25 per cent. alcohol and a sufficient quantity of 90 per cent. alcohol. How much of the last will be required? Substituting
P = 90, W = x, p′ = 50, p″ = 25, w = 2, p = 10, w′ = 10, and

$$(90 - 50)\,x = (50 - 25)\,2 + (50 - 10)\,10.$$

x = 11·25 kilos 90 per cent. alcohol required.

(*b*) You desire to make 10 kilos diluted alcohol, U.S.P. (45·5 per cent. by weight), using 2 kilos 40 per cent. alcohol. How much 91 per cent. alcohol and how much water will be required?

* From *New Remedies*, January, 1883.

$$P = 91$$
$$p' = 45{\cdot}5$$
$$p'' = 40$$
$$p = 0$$
$$w = 2 \text{ kilos}$$
$$W = x,$$

then $w' = 10$ (amount to be made) $- 2$ (weight of w) $- x$ (amount of W)

$$(91 - 45{\cdot}5)\, x = (45{\cdot}5 - 40)\, 2 + 45\, (10 - 2 - x)$$

and $x = 4{\cdot}1 =$ weight of 91 per cent. alcohol required.

$10 - (2 + 4{\cdot}1) = 3{\cdot}9 =$ weight of water required.

Other and different cases might be presented, but the above will show the general application of the rule, not only to the dilution of alcohols, acids, etc., but also to the bringing up of the strength of solutions, as, for instance, when it is necessary to fortify a wine.

THE ADULTERATION OF COCHINEAL.*

BY DR. JULIUS LOEWE.

Commercial cochineal appears in two forms, according to the method used in killing the insects, namely either as dull grains covered with a white dust, or as shining, blackish-brown grains, free from dust.

The whitish variety has long been known to have been subject to adulteration, by being weighed with 10 to 12 per cent. of mineral substances—such as sulphate of barium, carbonate or sulphate of lead, chloride of lead, talcum, etc.,—mostly all such substances as combine a high specific gravity with small bulk. The amount of such impurities may generally be detected by estimation of the ash of the cochineal: the unadulterated drug yielded not much over 0·5 per cent. of ash.

On account of the frequent adulteration of the white variety, purchasers fell into the habit of demanding the dark, undusted kind, which appeared to offer a better guarantee of purity. But even this has, of late years, been frequently found adulterated with various substances, as binoxide of manganese, sulphide of lead, ferric oxide, etc.

The method of adulteration, in this case, is generally so perfect that even a good judge will often be unable to detect it by mere inspection. It was, therefore, of interest to ascertain by what means this adulteration is so skilfully performed, and a series of experiments soon led to the discovery of the method.

To moisten cochineal with a cold adhesive liquid, such as solution of gum, etc., and then to add the weighing material, does not lead to the desired result, since the accompanying water extracts colouring matter from the cochineal, which imparts a red colour to the added mineral matters, and thereby detracts from the appearance of the article. Besides, the foreign substance does not penetrate sufficiently into the ridges of the insect, and only adheres to it very superficially, so that it may be easily recognized.

By the following method, however, the weighting may be done perfectly, and it is this method which is used, on a large scale, by the adulterators.

Cochineal is cautiously exposed to an atmosphere of steam, great care being taken that it does not come in contact with any water of condensation, but be merely enveloped in steam. The grains thereby swell up to several times their volume, and from their ridges exudes a very small amount of strongly adhesive red juice which serves as a glue for the weighting material to be added. As soon as the grains cease to increase in bulk, they are removed from the atmosphere of steam, and transferred in a suitable vessel—flask, drum, etc.—when the mineral substance is added (up to 10 or 12 per cent.), and the vessel is set in rotary motion until the material is completely taken up by the adhesive juice adhering to the insects. The grains are then removed and dried in a current of warm air, when they contract to their previous volume, and retain the weighing material concealed within their folds and ridges. By this method white mineral substance afterwards added remains uncoloured, and the dark substances previously incorporated remain undetected.

It appears, therefore, to be, under all circumstances, advisable to purchase only such cochineal as has been found pure, on estimating the ash. It is true, that this might also be made nugatory, if organic substances were used as adulterants, for instance, flour as "white substance," and asphaltum as "dark substance." Yet, if this were done, the real purpose of adulteration would not be attained, since these substances have but a small specific gravity compared with their volume, and would, therefore, not likely be chosen.

* From *Dingler's Pol. Journ.*, 246, 90. Reprinted from *New Remedies*, January, 1883.

EFFECTS OF IRON ON DIGESTION.*

In an inaugural dissertation published at Berlin, Dr. A. Düsterhoff records the results of some experiments bearing on this subject. One gram of fibrin was added to 20 c.c. of artificial gastric juice, and during digestion equivalent quantities of various preparations of iron were also added. At the end of the process the undigested fibrin was dried and weighed, and the quantity of soluble syntonin in the solution was also estimated. The time of digestion was in one case three hours, ten minutes, in another it was seven hours and a half. In the first series 0·0614 gram of metallic iron was in each case added, in the form of pyrophosphate, perchloride and protolactate respectively. In the second series, various other preparations were used, the amount of metallic iron being in each case equivalent to 0·0077 gram. Other experiments were made with white of egg; the amount of albumen precipitated by boiling after digestion being estimated. The outcome of the experiment is—that the organic salts of iron seriously hinder and check peptic digestion. Probably the hydrochloric acid of the gastric juice displaces the organic acids from the iron salts and so is used up; while the free organic acids in the digestive fluids are far less powerful digestive agents than the hydrochloric acid. But this cannot be the only cause at work, for perchloride and phosphate also tend to hinder digestion. Even reduced iron has a similar effect, for it partially dissolves in the juices, forming chlorides. Its solubility, like that of the phosphate, is however not very great. Ferrous salts seem to interfere less with digestion than ferric salts.

EXTRACT OF MALT WITH QUININE.

Extract of malt	195 parts.
Hydrochlorate of quinine	1 part.
Glycerin	4 parts.

Dissolve the hydrochlorate of quinine in the glycerin, and mix it with the extract of malt.

This preparation should be freshly made when wanted for use.—*New Remedies.*

EXTRACT OF MALT WITH IODIDE OF IRON.

Extract of malt	96 parts.
Solution of iodide of iron	4 parts.

Mix them.

The solution of iodide of iron is prepared by bringing together 3 parts of iron with 8 parts of iodine, and enough water to make 40 parts, when the reaction is completed and the liquid filtered. Twenty parts of this solution contain 5 parts of ferrous iodide.

This preparation should be freshly made when wanted for use.—*New Remedies.*

* From the *Centralb. f. med. Wiss.*, November 11, 1882. Reprinted from the *Practitioner*, January, 1883.

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THE ALKALI INDUSTRY.

THE history of the manufacture of soda and potash salts has been marked by some very unexpected results, which have not always been profitable to those most closely connected with the industry. When nearly a century ago the French pharmacist, LEBLANC, was engaged in working out the process for manufacturing soda crystals ever since associated with his name, he little anticipated that whilst his labours would bring little more than an almshouse and a pauper's funeral to himself, they would lay the foundation of a most important industry, which, during a long series of years was fated to be carried on principally in a country which was then the greatest rival of his own. So, too, another French pharmacist, BALARD, after many years of patient investigation and experiment, had only just succeeded in elaborating remunerative processes for obtaining potash salts from the salt marshes of his native district, when all prospect of monetary profit from them was dispelled by the announcement of the discovery of enormous saltine deposits in North Germany. On the other hand, when at various times a due regard to the public health and convenience has imposed upon the soda industry conditions which at first seemed to be unbearable, the real outcome has been fresh "leaps and bounds" of prosperity, continually giving new force to the adage that "Necessity is the mother of invention." It has been understood, however, for some time past, that an ebb in the tide of prosperity has become manifest; manufacturers are said to have been carrying on operations without profit, or even at a loss, whilst, this notwithstanding, the Board of Trade returns just issued for 1882 once more show a decrease in the export of alkali from the United Kingdom. Under such circumstances any observations upon the subject from so experienced a manufacturer and chemist as Mr. WALTER WELDON would have been sure to have attracted attention; but it may be truly said that a paper on the present condition of the soda industry, read by him a few evenings since before the London Section of the Society of Chemical Science, of which he is the President, is one of the most interesting and surprising contributions to the history of applied science that has yet been made.

Mr. WELDON commenced with a gloomy picture of the condition of the LEBLANC soda industry in this country at the present time. On the Tyne, out of twenty-five works that were in operation a very few years ago only thirteen are now worked, eight of the others having been actually dismantled in despair of ever again being able to manufacture soda in them by the LEBLANC process except at a loss. Even in Lancashire, where the manufacture is carried on rather more advantageously in respect to supply of material and nearness to markets, several alkali works are standing still, and few are working up to their full capacity for production. In Belgium the manufacture of soda by the LEBLANC process has absolutely ceased, whilst in France, Germany and Austria, where both soda and chlorine products are protected by high duties, it stands in considerable peril. One of the principal factors to this state of affairs has been the phenomenal growth of the soda manufacture by the ammonia process, which, as Mr. WELDON puts it, "has come upon the makers of LEBLANC soda almost like a thunderbolt out of a clear sky." A dozen years ago the total quantity of soda manufactured by this process barely amounted to one thousand tons in the year, but now it is estimated that on the Continent alone it reaches one hundred and ten thousand tons annually, and it is still rapidly augmenting. No doubt this contrast of prosperity and adversity in the two processes is attributable mainly to the fact that—under present conditions as to the cost of sulphur and the price obtained for the chlorine bye-product—when the manufacture of LEBLANC soda is yielding no profit at all, that of ammonia soda is yielding fully £1 per ton. As if these circumstances were not sufficiently adverse, the makers of the LEBLANC process are now threatened by a new and even keener rivalry from another quarter. It appears that Spanish and Portuguese pyrites are capable of yielding, besides sulphur and iron, about 3 per cent. of copper, and small quantities of the precious metals, sufficient to more than repay the cost of extraction. When most of the sulphur has been burnt off from the pyrites for sulphuric acid, the residual "burnt ore," or "pyrites cinders," is now treated by the wet way for the extraction from it of copper, and in most cases of gold and silver also, and after these have been removed there remains an almost pure oxide of iron—known as "purple ore"—which finds a ready sale for various purposes in connection with the manufacture of iron and steel. Moved by these considerations, and by the fact that French pyrites does not contain copper, the Rio Tinto Company—one of the great companies dealing in Spanish pyrites—has promoted a subsidiary company, with a capital of £1,200,000, for carrying on in France and other countries the manufacture of soda by the LEBLANC

process, using Spanish pyrites in the operations. This new Company, however, will not rely for its profits either upon soda or chlorine, but on copper and oxide of iron. Soda and chlorine will be simply extra products in connection with the first stage of converting pyrites into pyrites cinders, which the Company will be content to sell at the bare cost of manufacture if no better price can be obtained.

Notwithstanding the advantages attached to the ammonia process it was at one time thought that these would be limited by the increased cost of ammonia, consequent upon the larger consumption, and by the rise in the price of hydrochloric acid due to the decrease in its production through the non-utilization of chlorine in the ammonia process. So far, however, as ammonia is concerned, the prospect of its cost affecting the question is fading into the remote distance, for here again the occasion has been productive of the application of chemical and mechanical skill. The collection of the ammonia formerly allowed to escape from coke ovens has been remuneratively effected, whilst the application of the same idea to blast furnaces has been sufficiently developed to render probable the early appearance of ammonia from this source in the market. As to hydrochloric acid, with the decrease in its production and the probable consequent increase in its price came attempts to recover the chlorine from the residual calcium chloride which has hitherto been a waste product in the ammonia process; but this has not yet been effected economically.

In the face of all this, Mr. WELDON asks, "How are the English LEBLANC soda manufacturers to continue to live?" The outlook is undoubtedly gloomy; but Mr. WELDON sees some breaks in the clouds in the promise of a more complete utilization of all the raw materials. There appears also to be a probability of an early considerable fall in the price of pyrites; but at the most this would not be likely to make up for more than about one-third of the twenty shillings per ton which is said to be the present difference in the cost of manufacture by the two processes. But there are especially two resources within reach, which he considers to be probably sufficient to turn the tables upon the ammonia process and make the old LEBLANC process the cheaper of the two. These are sulphur recovery and cheaper fuel. The cost of Sicilian sulphur, delivered at Marseilles, is about £5 per ton, and the amount which will have to be made up after the anticipated fall in the price of pyrites to equalize the cost of soda production under the two processes is estimated at about 12*s.* per ton of alkali. By recent modifications in the SCHAFFNER and HELBIG sulphur recovery process it is confidently hoped that the whole of the sulphur may be recovered from soda waste in the free state, and as this would amount to 6 cwt. per ton of soda, the profit on this recovered sulphur should amount to at least 2*s.* per cwt. The problem, therefore, may be stated thus: in order to become masters of the sulphur market, and at the same time to gain by the recovered sulphur the required profit of 2*s.* per cent., it will be necessary that English soda makers should be able to recover sulphur at a cost not exceeding £2 per ton. This, it is satisfactory to learn, Mr. WELDON thinks they will be able to do eventually, though not at first. With respect to economy of fuel, a vast revolution is hinted at. The suggestion is that "the soda maker should entirely cease to use raw "coal as fuel, but should convert all his coal into "coke, collecting for sale the oil and ammonia "evolved during its conversion into coke, and him-"self using for heating purposes the gases evolved "during the coking operation and the coke itself." It is believed that in the Newcastle district, where some two millions of tons of small coal, rich in its yield of oil, is produced annually, and is almost a waste product, the soda maker would be enabled thus to get his fuel for nothing.

It is evident from what has already been said that this paper is singularly rich in suggestive matter, which promises to exercise an important influence on the future of other industries besides the soda manufacture, and we hope to have an early opportunity of printing it *in extenso* in the pages of this Journal.

"HALF AND HALF" DISPENSING.

FOR some time past an active correspondence has been going on in the pages of one of our medical contemporaries as to the advisability and possibility of medical practitioners leaving the dispensing of medicines to pharmacists. We are quite content to note the manifest advance of opinion in the direction that as far as possible pharmacists should be entrusted with the work for which they have been specially trained, and for which, as pointed out by one who speaks with the authority of a medical examiner, medical students under present conditions have scarcely any training at all. But there has also been an ample exhibition of the old bugbears—counter prescribing, exorbitant charges, and even the assumption, as by a writer in the *British Medical Journal* last week, that dispensing is best conducted under the supervision of the prescriber. A case reported on p. 598 of this Journal furnishes a cruel commentary upon these objections. Even "counter prescribing" for simple ailments will pass muster by the side of prescribing for a patient through the intervention of a domestic and a messenger, whilst the dispensing by a housekeeper of "half and half" from two out of a row of bottles is perfectly grotesque. We do not mean to insinuate that this case is typical of medical dispensing, but it is by no means singular, and we feel justified in referring to it for the purpose of enforcing the risks that are inseparable from the practice, not at all unknown, of drawing general conclusions from exceptional cases.

"Polarimeters and their Practical Application" is to be the subject of a Lecture by Mr. C. O'Sullivan, to be delivered under the auspices of the Council of the Institute of Chemistry, in the room of the Chemical Society, Burlington House, on Thursday next, the 25th inst. There are to be experimental illustrations.

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On Tuesday last, at the Royal Institution, Professor C. W. Williamson began a course of five lectures on "The Primeval Ancestors of Existing Vegetation, and their Bearing on the Doctrine of Evolution," and on Thursday, Professor Dewar began a course of nine lectures on "The Spectroscope and its Applications." An abstract of Professor Williamson's first lecture will be found on p. 594.

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On Thursday evening next, the 25th inst., Mr. C. F. Cross is to read a paper before the Applied Chemistry and Physics Section of the Society of Arts, on the "Technical Aspects of Lignification."

* * * *

On Wednesday evening, Mr. W. K. Burton brought before the Society of Arts the important subject of the sanitary inspection of houses, in which he pointed out the damages that might arise from the negligent or unskilful carrying out of the best conceived sanitary arrangements and the necessity for provision being made that such work be supervised by competent persons.

* * * *

There seems to be some prospect at last of the proposed amendment of the law regulating the practice of pharmacy in France occupying the attention of the Legislature. A Bill brought forward in the Chamber of Deputies by M. Heppolyte Faure, formerly a pharmacien, having passed the ordeal of the preliminary committee, and been reported as fit to be taken into further consideration. The next stage is to refer the Bill to a special committee nominated by one of the bureaus of the Chamber.

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Referring to the importance of the crisis, the *Répertoire de Pharmacie* makes some pertinent remarks on the necessity of union among French pharmacists that may find an additional application in this country at the present juncture. It says: "For many years past we have assisted at a heart-breaking spectacle. Many of our brethren, obedient to their personal sentiments, aspirations and wants, have been pleased to criticize the various Bills that have been submitted to the public authorities; none of them has sufficiently borne in mind that a practical result can never be arrived at in proposing to abolish that which exists without stating positively what it is desired should replace it. Some, it is true, have indicated their idea of a pharmacy law, but many among them have not sufficiently reflected upon the inconveniences and dangers that would arise should their ideas prevail. The counsel which we have to give may be stated briefly: Be united, and, above all, be practical."

* * * *

M. Eugène Lebaigue, who for the last ten years has ably edited the *Répertoire de Pharmacie*, retired at the close of the year and his place has been taken by M. C. Thomas, one of his former *collaborateurs*.

* * * *

Two papers have just been issued by the Board of Trade containing returns relating to gas undertakings in England and Wales. These show that, during the year 1881, 6,365,336 tons of coal were carbonized to produce 63,345,300,497 cubic feet of gas, and that of this quantity 57,876,326,386 cubic feet went to supply the wants of 1,581,654 consumers or in the lighting of 293,379 public lamps. The capital and loans authorized amount to £60,577,736, of which £44,626,205 has been paid up or borrowed. The proportion of this business carried on by local authorities is about two-sevenths.

* * * *

The Accounts relating to Trade and Navigation of the United Kingdom just issued, show that the "peruvian bark" imported during the year 1882 weighed 138,763 cwts., and was of the estimated value of £1,781,482, whilst there was exported only 80,014 cwts., valued at £903,332. This would leave a good margin for the quinine manufacturers.

* * * *

The bellicosity that appears to be an essential concomitant of water analysis has invaded a new field. Concurrently with the setting in of the winter season there has been, as usual, an increase in the proportion of organic matter present in the London water supply, and in a report quoted by the Registrar-General the water supplied by four out of five of the London companies is pronounced for this reason "unfit for drinking." Messrs. Crookes, Odling and Tidy, referring to this in the report which they send periodically to the Local Government Board, say: "We take upon ourselves to assert that the analytical results set forth in the report, which are not appreciably different from our own, do not afford ground for any such appalling statements." The public may well be excused for wondering which of these important public departments receives sound scientific advice and which is misled.

* * * *

The *Lancet* mentions a case where an application by a ratepayer for a copy of the report of an analysis which had been made by order of the Local Sanitary Authority, on the well water used by his household, has been refused on the ground that it would "establish a dangerous precedent." An appeal to the Local Government Board only elicited an opinion that the point was one upon which the local authorities must use their discretion.

* * * *

According to the *Newcastle Daily Chronicle* the Public Analyst for the county of Durham is very dissatisfied with the recent magisterial decision in the sweet spirit of nitre case reported on p. 500. In his quarterly report he expresses his surprise and indignation that such a certificate should have been sent from Somerset House, and that the South Shields magistrates should have acted upon it. He maintains that the London Pharmacopœia has given place to the British Pharmacopœia and says that on all occasions he tests drugs submitted to him by the tests contained in the latter work.

* * * *

A medical contemporary, which a fortnight since referred to a "Russian remedy" for heart disease "which rejoices in the name of *Convallaria majalis*," last week made the astounding discovery that the plant is "the familiar lily of the valley," and, under the caption of "Nothing New under the Sun," has published the fact for the information of "those of our readers whose botanical knowledge does not go beyond the plants of the Pharmacopœia."

Provincial Transactions.

EDINBURGH CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

The sixth meeting of the present session of this Association was held on Wednesday, January 10, in the Pharmaceutical Rooms, 119, George Street. Mr. Peter Boa, President, in the chair.

The minutes of the previous meeting having been read and adopted, the Chairman explained that Mr. J. D. Robertson was unable to be present and in his absence he called upon Mr. Claude F. Henry to move Mr. Robertson's resolution regarding the sale of patent medicines containing poisons.

Mr. Henry said he regretted Mr. Robertson was unable to be present. He maintained that the sale of poisons by unqualified persons under cover of the patent medicine stamp was a glaring inconsistency and an undoubted public danger. The discussions which are going on both in the pharmaceutical associations and in the medical and pharmaceutical press showed that it only required that the general opinion of those best acquainted with the subject should be brought before the proper authorities in some combined and formal manner in order to bring about a much needed reform. He referred to some remarks made by the President of the Leeds Chemists' Association, which he understood had induced Mr. Robertson to give notice of this motion. As he fully agreed with Mr. Robertson in this matter, he begged to move:—"That this Association resolves to co-operate with all societies which are agreed that the present poison laws should be altered so as to include so-called patent medicines containing poisons and to take steps to bring the matter before the proper authorities."

The motion was seconded by Mr. William Aitken and unanimously agreed to by the meeting.

Mr. J. D. Robertson was appointed to act with the committee in carrying out the resolution.

The members then had an opportunity of examining a most interesting and valuable collection of new drugs, lent for exhibition by Messrs. Thomas Christy and Co., London; living specimens of *Erythroxylon coca*, *Guaiacum officinale*, *Theobroma cacao* and *Pilocarpus pennatifolius*; and a collection of microscopic objects, mostly pharmaceutical.

Mr. MacEwan described the more important of the new drugs, remarking that it was a collection of great value and was certainly the most important that had been brought before the Association. It included a series of Mexican drugs, exhibited for the first time in this country, among which the following were noticed:—Capsicum longum, Capsicum cordiforme (Chili mulato), Capsicum cordiforme (Chili ancho), Capsicum speciosum (Chili chilporth), Thevetia icotti, Croton niveus, Lippia citriodora, Ericonia floribunda, and yerba sel pollo. The other specimens included a series of Japanese drugs described by Mr. Holmes, several products of Carica papaya, Euphorbia pilulifera, cola nuts, Duboisia leaves and extract, guaco, Jamaica dogwood, pituri leaves, rusot, erythrina seeds (*Erythrina corolloides*), kombo gumbo bark, etc.

Mr. Hill, in drawing attention to the living specimens, remarked that they were grown in the botanic gardens and were in good condition for the season. The pilocarpus was a seedling plant grown in the gardens from seed brought home by the late Dr. Paterson, of Bahia. The leaves, it was pointed out, were simple not compound. In the case of one of the latest developed leaves, however, there were two leaves showing the gradual transition to the compound imparipinnate leaves characteristic of the fully developed plant. It was mentioned that Dr. Paterson had at the same time brought home some seeds of the goa powder plant (*Andira Araroba*) and these had been successfully propagated, and they had now in the botanic gardens a fine specimen of the plant, which was believed to be the only one in Europe.

Attention was also called to the microscopic specimens.

The President moved that the thanks of the Association should be given to Messrs. Thomas Christy and Co., London, for their collection of drugs, to Professor Dickson for the specimens of economic plants, and to Messrs. Gilmour, Purves, and Thompson, for microscopes and microscopic slides. The motion was cordially responded to by the meeting. A similar compliment was paid to Messrs. Hill and MacEwan for their arrangements and descriptive remarks.

Some further business having been disposed of, the Chairman announced the next meeting for January 31, when a paper on "The Manufacture of Sulphuric Acid," will be read by Mr. John R. Hill, the Secretary to the Association. The meeting then adjourned.

Proceedings of Scientific Societies.

ROYAL INSTITUTION.

By the courtesy of Professor C. W. Williamson we are enabled to publish the following *résumé* of the first of a course of five lectures, which was delivered by him at the Royal Institution on Tuesday last, on—

The Primeval Ancestors of Existing Vegetation and their Bearing on the Doctrine of Evolution.

Lecture I.

The object of the course is to examine each of the principal types of vegetation met with in the older fossiliferous rocks; to trace the links found in the newer rocks, connect those ancient forms with living ones, and finally to ascertain how far the results give support to the Darwinian theory of Evolution. The first great and conspicuous fact is that nearly all the flowering plants (angiosperms) are of very modern geological age, and have no true primeval representatives; hence they are not dealt with in the course. The highest types of vegetation found in the older (palæozoic) rocks belong to the group of gymnosperms, *i.e.*, the coniferous and cycadean plants. They indicate, so far as we know, the most advanced form to which vegetation was developed up to the cretaceous age, with the exception of a small number of doubtful monocotyledonous plants from the triassic and oolitic rocks. This general order of appearance is, so far as it goes, consistent with the demands of Darwinism, since the gymnosperms, associated with the ancient cryptogams, undoubtedly occupy an intermediate position between the latter and the monocotyledons, which in turn, are a less highly developed group than the dicotyledonous group which makes its first appearance at a still later age. This relationship of the gymnosperms to the inferior cryptogams on the one hand, and to the higher phanerogams on the other, is demonstrated by the organization of their reproductive structures. Thus, the pollen sacs of the lower conifers and cycads are little more than the sporangia of some cryptogams, and the contained pollen grains of the former correspond to the microspores of the latter. In like manner the flowers of the same conifers are reduced to elements so simple, viz., a single ovule, that each flower is little more than one of the microspores of the other. Attention to these peculiar relationships will again be called in the concluding lecture of the course.

On turning specially to the conifers we find that most of the well-known living genera, such as Pinus, Abies

Larix, Cedrus, and their numerous allies, made their appearance at a late date in the world's history, viz., along with the flowering exogens. When we descend amongst the older strata we find very different types to prevail. So far as the microscopic aspects of their woody tissues are concerned the most ancient conifers approach the semi-tropical araucarias of the southern hemisphere more closely than they do recent and more northern forms; but besides this general araucarian type we can trace back other special forms. One of the most remarkable of these is the Salisburia or gingko of China and Japan, the leaves of which resemble the leaf of a maiden hair fern much more closely than they do those of other conifers. True Salisburiæ lived in the tertiary age, not only in Europe and North America, but even in Greenland. The oolitic rocks of Siberia furnish a well-marked gingko, and the discovery of the peculiar fruits has shown that the widely diffused oolitic Baierias, long regarded as ferns of the genus Cyclopteris, are in reality Salisburias, and the American permians have furnished a similar type. In the carboniferous and Devonian rocks of Great Britain and America numerous stems and branches abound of the remarkable genus Dadoxylon. Recent researches have made it probable that this, apparently the most ancient gymnosperm, has organic features, linking it with the gingkos, and being the ancestral stock from which they have sprung.

Turning to the great group of the Abietaceæ, it is interesting to find a true cedar in the cretaceous rocks as well as a sequoia, a close relative of the so-called Wellingtonia, the great tree of California. In the oolitic we find a numerous group of conifers, apparently including true representatives of the araucarias as well as cypress-like forms. In the liassic strata, forming the base of the oolitic, we find still more generalized plants, in which the cones resemble those of one modern type, associated with the foliage of another. Descending successively to the Keuper, the Triassic and the Permian beds we meet with a succession of yet more generalized types, leading us still further away from the living ones. In many of these the compact cones of the latter gradually become more elongated and lax until some of them more closely resemble branches clothed with woody foliage rather than true cones. Below the Permian the conifers are only represented by the dadoxylons already referred to.

The other great division of the gymnosperms, the Cycadeæ, presents a very similar history only so far as stem and foliage are concerned; the modern type of Zamia abounds not only through the tertiary cretaceous and oolitic rocks, but are met with even in the Permian strata. As is well known the oolitic age has been designated the age of gymnosperms, hence, the peculiar conifers and cycads of that period undoubtedly constituted its dominant forest vegetation.

On reaching the carboniferous beds the oolitic types have wholly disappeared, their place being taken by a remarkable group of which the genus Cardaites is the typical representative. The male and female inflorescence of these plants has been found in remarkable perfection at St. Etienne, in France, and though these structures differ widely from those of living cycads, there is no reason for rejecting the idea that some of them are the ancestral stocks from which the oolitic types and through them the living forms have sprung. That these plants constituted a very important feature in the carboniferous woodland landscape is shown by the fact that the seeds of numerous genera and species of Cycadeæ are met with in vast numbers both in Europe and North America. Though formerly the cycads were so abundant in the northern hemisphere, even within the arctic circle, they have now entirely abandoned that hemisphere, being only met with south of the equator, where they extend in an almost unbroken zone on the outer skirt of the tropical regions from Australia and New Zealand, through Africa to Central America.

CHEMISTS' ASSISTANTS' ASSOCIATION.

Plant Names.*

BY C. E. STUART, B.SC.

"What's in a name? That which we call a rose,
By any other name would smell as sweet."

The truth of this well-worn dictum seems undeniable. And yet the fair Capulet whose thought it embodies was nevertheless anxious to get the name of her ideal altered, or even (in which I believe she would not in the present day be singular) to change her own. This may be merely a characteristic bit of feminine inconsistency, but I think it at once casts a doubt on the literal acceptance of the apparent truism put by the bard into the lips of Juliet.

If we look into the matter we shall find that the principle is true in itself, but that its truthful application is rarely if ever met with. For when is a name merely a name? Perhaps it is to such a country bumpkin as Wordsworth has described, whose

". . . . primrose by the river's brim
A yellow primrose was to him,
And it was nothing more."

But almost invariably a name has meaning and associations; it calls up in the mind a picture, awakens memories, and affords food for thought and reflection.

Now I want in this paper to try and paint a few pictures with plant-names as subjects, touching up old ones, and presenting perhaps for criticism a few that may be new to you.

Botany used to be contemptuously spoken of as a science of hard names; but that was before organic chemistry existed;—organic chemistry with its many-syllabled names, which are the astonishment of the vulgar, and at which even pharmaceutical students will sometimes open their mouths, yet which are generally what names should be—pictures of the things named, albeit often sadly wanting in arrangement (which is form) and clearness (which is colour).

Of plant names, as given by botanists, the chief fault is that there are too many of them; portentous lists of synonyms being prefixed to the descriptions of very many even of our well-defined British species. This arises mainly from the imperfect knowledge of the structure and affinities of the plants which have been by fabricators of Floras distributed into genera and species. Thus the original discoverer of a plant may, after a cursory examination of it, assign it to a particular genus, or create a new one specially for it; while another observer by more patient and detailed investigation obtains a more accurate knowledge of it, and may change the generic and specific names accordingly. Then comes perchance another ardent student who rediscovers our plant in some other locality, and if, as will probably be the case, it is unknown to him, whether he be Smith or Jones, promptly is *Smithia viridissima* or *Jonesia unica* installed in the new Flora, where its affinities may for time more or less prolonged give rise to interesting discussions, until on comparison of authentic specimens in old and new Floras the duplex designation becomes apparent.

Or of two observers describing the same specimen, one may assign greater diagnostic importance to some one characteristic, and the second to some other characteristic; and the plant may go to this or that group accordingly. This difference of opinion is due to the laxity of the definitions of many genera and species; a laxity which must always exist to a greater or lesser extent, but which may be removed in great part in many cases by careful investigation and reasoning, and also by the study of new species in relation with older ones. As an example of the benefit of this last suggestion may be given the following extract concerning the genus *Parnassia*.—"It has been most generally placed among Thalamifloræ with Droseraceæ, next to Violaceæ and Polygalaceæ;

* Read at a meeting of the above Association, December 20, 1882.

but its close affinity with Saxifraga and Chrysosplenium has now been fully proved, *especially by the recent publication of several curious Himalayan species.*" (Bentham, 'Flora').

At the same time it must be noted that the continual normal variation of species will often render a particular individual difficultly referable to its proper species, and that many species are so nearly allied that they provide links between one genus and another, rendering sharpness of definition impossible.

In connection with this subject it may be mentioned that many of the plants alluded to in classical writings are now difficult of identification; first on account of vague description, and secondly on account of change of name rendered needful by modern knowledge. Thus the Greek "*Jasione*" is our *Convolvulus Sepium*, while we give the name "Jasione" ("the healer") to the sheep-bit. Again, *Hibiskos* is the marsh mallow, *Althœa officinalis*, and not the shrub now termed hibiscus. And in Virgil's beautiful lines, Ruskin translates the "*pallentes violas*" which the white nymph Nais was to gather for Alexis, as "pale flags," not violets which we now associate with Viola.

The multiplication of synonyms appears then in the present state of our science to be to a great degree unavoidable; and having pointed out the reasons for this, I will pass to the consideration of the names of the plants as most commonly accepted:—

In the first place, Have the names been given to plants according to any plan? I may answer, Distinctly not.

Linnæus was, as students of Bentley will remember, the first who definitely laid down the system of binomial nomenclature, that is, the giving of both a generic and a specific name to each kind of plant, and numbers of his names are still the accepted ones.

Jussieu and De Candolle defined most of the natural orders.

In analysing the British orders, genera and species, we shall find examples, so far as I am aware, of all the origins of plant names. I shall, therefore, refer almost entirely to them.

First then of the natural orders:—

1. The names are taken from some typical genus of the order. To this heading place all the British orders, as Rosaceæ from *Rosa*, Ranunculaceæ from *Ranunculus*, etc., with the exception of those to be next mentioned.

2. The names are taken from some peculiarity of flower, leaf, etc., running through the order. Such are—

Cruciferæ
Aquifoliaceæ
Umbelliferæ
Caprifoliaciæ
Compositæ
Labiatæ
Amentaccæ (Cupuliferæ)
Graminææ
Coniferæ.

Next:—Genera. These are—

1. Either named after themselves by discoverers, or after discoverers by subsequent describers; or again by discoverers or by subsequent describers are dedicated in the name and to the memory and glory of more or less distinguished botanists whatsoever.

This practice has some merits, but it leads in many instances, as I shall show later, to the most barbarous cacophony and word-coining.

2. Names are given at the sweet or malicious will of the name-maker, and with or without reason (generally the latter, so far as my imagination will let me discover), commemorative of some celebrated personage or place; and these are of two classes, historical and mythical.

Of this practice, the obvious criticism is, where there is rhyme and reason for the doing, where the name fits the plant and violates no probability nor stretches the imagination too sharply, and specially if the name is good Latin or Greek, then let us applaud it; if not, then be it condemned.

And 3. Some peculiarity of a plant or plants of a genus, peculiarity either real or imaginary connected with size, shape, properties and so on, has earned it its name.

This is by far the most general origin of the generic name, and to my mind is about the most legitimate method of name formation.

For as the natural system of plant classification has in its broad basis the advantage over the Linnean system, in that it brings together plants of similar structure and habits, which by the latter were arbitrarily separated and grouped by mere number of certain parts, a method erroneous in principle, for throughout nature number is consequent on structure, and not structure on number; so in the details of the natural system, an arbitrary plan of distributing generic names is to be deprecated and abandoned in favour in this case also of a natural system of name giving; a system carried out on such excellent lines as shadowed forth in the names aconitum, convolvulus, stellaria, and shall I say myosotis? the last a name at which I have heard some sentimentalists rail, but which in its meaning of mouse-ear as applied to the shape and texture of the leaves of the genus has always seemed to me more appropriate than the English Forget-me-not, while its Greek softness is equally pleasing to the ear.

For examination of the various reasons governing the adoption of specific names I can do no better than refer you to Gray, as quoted by Bentley, in his 'Manual,' who takes as an illustration the genus Viola. You will remark that nearly all the specific names indicate qualities or peculiarities of the several plants, but that frequently a botanist's or other name is dragged in as a substantive or as an adjective, and also that as many old species have been transferred to other genera, their former generic name has been retained as a specific name, as is the case with *Lythrum Salicaria*, *Dianthus Armeria*, etc.

Turning back now to develop the peculiarities of the generic names—

Of the first, the discoverer's or celebrated botanist's class, I will remark that the cases are very rare in which it is not a positive insult to a plant to connect it with the name of a man. So delicate is the charm, so quiet and unobtrusive is the growth of our wayside flowers, so elevating are the thoughts which they naturally suggest, that any connection of them with human affairs seems utterly out of place, True, types may be found in plant life of many, I think not of all, of the varied habits and instincts, faults and virtues, littlenesses and greatnesses of human nature; but that is no reason for connecting any plant with that specific unit of humanity known as a botanist. To the great, however, to the illustrious pioneers of the science it may be permitted that their names should be enshrined in and so adorn the catalogue of plant names. Thus I exemplify the name *Linnœa*, and a modest little alpine herb has an undying interest thrown around it by its sweet-sounding and honouring name of *Linnœa borealis*.

But apart from the above somewhat sentimental objection to proper names as generic terms, there is the real one of untranslateability. How many common English, German or French names will translate themselves into Latin with euphony and without outraging the ear of the scholar?

Glance down the list of genera and say what you think of such terms as—

Clarkia
Bouganvillea
Eschscholtzia
Rodriguezia
Catleya
Ludwigia
Saussurea
Scheuzeria
Sibthorpia

Teesdalia
Wolffia
Zannichellia.

These are names proper enough and significant enough in their native garb; but when, like Bottom the Weaver, they are "translated" behold they, as applied to plants, are as much out of place, as ugly and as earthy as was that otherwise worthy Athenian citizen among the fairy denizens of the woodland shades.

Ruskin says, in his odd but suggestive botanical work, 'Proserpina,' that "a day will come when men of science will think their names disgraced, instead of honoured, by being used to barbarize nomenclature," and I hope such may come speedily.

I will, however, note that there are some names which seem made to Latinize; as that of the great Swede Linné already mentioned; Asa Gray, which as Asagræa looks a thoroughly Græco-Latin designation; and Lobel, for which, until I read a sentence in Professor Attfield's address to the School of Pharmacy Students' Association, I should have been fully prepared to turn in my Latin dictionary and find as Lobelia its hidden kernel of meaning. "Lobel" is perhaps unknown to many of you; as adding, therefore, henceforth a new interest to the medicinal plant, I may state that Lobel was a native of Flanders, born in 1538, died 1616, and was botanist and physician to our James I.

Next, of proper names arbitrary and imaginative.—These are in many instances not sharply defined from the next or peculiarity class, some peculiarity of habit or structure often dictating the imaginative proper name.

In this class much of the poetry of plant names is found. We are told by one of Virgil's shepherds that the anger of Amaryllis is to be feared as the wolf to the fold, showers to the ripened corn, or storms to the stout trees; and truly the beauty of many of the Amaryllids is so superb that one can imagine any slight to it being rebuked with a proud and glowing scorn.

Andromeda is to be found by the adventurous vasculum-bearing Perseus in trembling watery peat-bogs, growing blushingly erect in the domains of the amphibian monsters, the frogs and newts.

Atropa suggests the Fate, Atropos (the inflexible), whose shears cut short the thread of human life: hence most appropriately given to the deadly nightshade. The specific name *belladonna* comes oddly in opposition with Atropa, for the Fates were not usually represented as beautiful, but rather as grey old women.

Adonis vernalis with its crimson petals tells of the fatal wound inflicted on the Thracian hunter by the fierce wild boar; but are there not many other things which it might with no further exercise of ingenuity be thought to shadow forth?

Iris, the messenger of the gods; Hercules, as *Heracleum* Actæon, as *Actæa*, are other mythological names, the suitability of which my imagination is not sufficiently active to discover.

On the historical side valerian is called after Valerius, who first used it in medicine and who has therefore a rightful claim to memory; but what claim has Gentius, King of Macedon, to immortality in connection with the beautiful tribe of gentians? Ruskin hints him rather undeserving, and suggests *Lucia* as a generic name; Lucy of Teesdale then being the spring gentian, whose blue eyes thrilled a friend and myself with delight as we saw her in April for the first time on her native heaths around the high Force of the Tees.

Now comes an instance of naming which is at first sight puzzling. How comes it that the genus *Euphorbia*, so acrid and poisonous, bears the Greek name for "good nourishment," which it most distinctly is not? The mystery becomes clear only when we find that this is a historical name. Euphorbus, the first to use the plants of the genus for medicine, was physician to King Juba of Mauritania, and possibly this name of his, with its meaning given above, was but a nickname given to him by his patients signifying that as court physician he lived on the fat of the land.

Thirdly, as to intrinsic generic names.

It is in this class of name that we find most of the quaint conceits, old delusions and superstitions, and imagined resemblances of and concerning plants, as well as happily caught characteristics and vestiges of simple-craft still more or less credited,

They may be best divided into names more and names less imaginative. I will give you one or two examples of each, taking the latter first.

Such is *Acanthus*, from the Greek *akantha*, a thorn; *akanthis* being a thistle, probably like our Scotch thistle, and *akanthos*, that acanthus whose spine-tipped leaves adorn the capitals of Corinthian pillars.

Cratægus is a name a step removed from the evident correctness of epithet of the above example; *Kirasos*, its root, meaning strength, and this, as applied to the wood of the wild service-tree, the original *krataigos*, is not so fitting a bestowal as that of the thorn bound up with the thistly acanthus.

Fumaria, the smoky, applied to the fumitories, is apt, as all will concede who know the grey misty foliage of the genus; but it is more imaginative than the two former instances.

The geraniums of our summer woods recall with their long beak-like fruits the crane whose Greek name *geranos* they bear.

The Robert of *G. Robertianum* is, as some suppose, a Benedictine abbot to whom is dedicated the twenty-ninth of April about which time the herb comes into flower. But it appears to me that it cannot count for nothing that names Robert and Robin are given to *red* creatures, as to this same Herb-Robert, to

"that little weed of ragged red,
Which bids the robin pipe;"

and to robin redbreast; the inference being that savage and almost inarticulate primæval man, struck with the stimulating brightness of the rays of slow vibration in the solar spectrum, signified the effects of them by the purring pleasure of the rolling R, which is more fully developed in *Rhodon*, *Rosa*, *Rosc*, *Rhœas*, *Rhoia* (pomegranate), applied to red plants, and in Robin, Robert, Rupert, applied to red men.

Rubus, again, has the same root of redness; and the genus, whether in its pink-hued flowers, its purple fruits or fruit juice, or its crimson autumnal leaf-tints, is fully worthy of its name.

Lysimachia and *Lythrum* are both Englished as Loose-strife; this should etymologically be only of the former; and as I am unable to find that it *does* loose strife, I think we must fall back for explanation on the theory that the name commemorates Lysimachus, a friend and general of Alexander the Great, and hence this belongs properly to the second class of names.

A splendid example of the purely imaginative name is *Chelidonium*, meaning swallow-wort, so called because it flowers at the time when the swallows return in the spring.

Lamium offers us an open choice of derivation. It may either be from "*Lama*," a ditch, from its place of growth; or from "*Lamia*," a snaky monster given to preying on unwary youth (Keats has a fascinating study of one); or else from "*Laimos*," the throat, the root whence *Lamia* is derived. This latter, seeing the gaping throat of the flower, seems the most fitting starting point.

Scrophularia and *Pedicularis* are instances of plants named from diseases for which they were once supposed efficacious.

Now I have run through a few illustrative instances of the various methods of plant naming which I have enumerated. It remains for me to say a few words on hard names. It is a habit with the unreflecting to stigmatize names which they find lengthy and unfamiliar as pedantic, harsh and unnecessary. But they do not per-

ceive, what a little thought would tell them, that in the language to which they belong they may be as fitting and as fraught with pertinent meaning as any familiar English name. Thus, *Pardalianches* is a hard, uncouth-looking word, but it is simply our English Leopard's-bane, and as a Greek word it is by no means unmusical. And so with *Anisopetalum*, *Cryptarrhena*, *Eulophia*, *Ornithidium*, *Pleurothallus*, *Stenorrhyncus*, *Xylobium*, at which Ruskin grimly sneers.

And this reminds me of a new system of plant naming and classification proposed and partially carried out by this distinguished art-critic. Its leading principles are somewhat as follows:—Starting with no scientific botanic knowledge, many of the prejudices of the past may be thrown aside. Begin, therefore, by relying on your own poetic judgment for the division, so that (for instance) *oxalis* and *anemone* both come into the same order, since both are delicate flowers delighting in the woods. That they do delight in the woods is an historic fact, and as historic facts (it is well known) equally with "relative conditions of character and climate," are so unchangeable, if plant classification and naming is founded on them rather than on distinctive differences of form, which are so many, so subtle, so liable to continual reinterpretation, then we shall have unalterable groups which may be added to, but not disturbed or reconstructed. That is, in this world of change and imperfections we shall have at least a perfect and immutable system of both terminology and nomenclature.

Note, that the reasons given for this change are first, that many names are barbarous distortions of Greek and Latin words; second, that many names carry with them coarse and degrading suggestions. Both these propositions may be acquiesced in; but do they furnish sufficient reason for the upsetting and total remodelling of all plant arrangements as well as all plant naming? The third reason is, that the botany of Ruskin, being intended to be useful to the vulgar rather than to the scientific, should give to plants names characterizing them individually, and not founded on their connection with other plants at the Antipodes. Thus, Herb-Robert might be called shortly "Rob Roy, and have done with it," rather than, dwelling on its connections, christen it "Macgregoraceous."

This reason, which is no reason but a dogma, strikes at the root of natural classification, and at once places the system outside serious consideration. It sets out the dream of a poet, imaginative, beautiful, but unpractical. However, there is much to be learnt from the eloquent imaginings of its gifted author; one great lesson being not to look upon plants simply as material for dissection or for preservation in musty folios. Text-books must and text-books do take chiefly this view, but it is a healthy change from the consideration of plants as "subjects" (as the medical student would put it), to regard them as "objects" full of life, beauty and character, with ways, wills and instincts of their own. Dryad-haunted tree, starry flower, fertile grass of the field, to these are we indebted for the filling up of great portion of the wants and pleasures of our existence, and the fuller knowledge of them in all their varied forms, habits and necessities cannot but have favourable effect on human joys both actual and ideal.

Parliamentary and Law Proceedings.

Dispensing in a "Surgery."

On Friday, January 5, the Macclesfield Coroner (Mr. Yates) held an inquest at the Town Hall touching the death of a widow named Elizabeth Walker.

The first witness called was—Hiram Walker, labourer, who said the deceased was his mother, 72 years of age. She had been in pretty good health lately—nothing to cause any alarm, but was taken ill on December 26, complaining of a bad cold. On the 28th he went to the sick club, of which she was a member, for a note to get the doctor to attend her, and afterwards went to Mr. Jotham's surgery in Duke Street, where he waited forty minutes, but could get no one to answer. He left the note on the counter and went home and stayed with his mother, who kept "in a middling way" till after midnight on Saturday night, when she got worse. On Sunday morning, between nine and ten o'clock, he went again to Mr. Jotham's house in Roe Street, but did not see Mr. Jotham. His housekeeper answered the door, and he told her that he had come to see the doctor, about Mrs. Walker. She said Mr. Jotham was upstairs in bed, and that she would tell him. She went upstairs, and from the top of the stair called down to him to know what ailed her—whether she had any pain. Witness replied no, that she was only coughing. The servant then went into Mr. Jotham's room, and eventually came down and mixed a bottle of medicine in his presence. He took the medicine home and gave his mother a dose (a tablespoonful), which she was to take every four hours. She died in about ten minutes after taking the medicine. The servant took the physic out of three different bottles, and put it in the one produced (one of Parkinson's large-size soda water bottles, which was nearly full of a muddy, dark-coloured liquid).

Jane Morton (Mr. Jotham's housekeeper) was the next witness. She said she remembered the last witness coming to Mr. Jotham's house on Sunday morning, December 31, between nine and ten, and stating that his mother was very ill—very low. Mr. Jotham was in bed; and she went upstairs to him, told him what the man said, and by his order she gave him a bottle of medicine.

The Coroner: Did you mix it?—No; it was ready mixed—it always is.

What, for anybody's complaint?—No; but for that complaint. Witness added that she got the medicine out of two bottles which were plainly labelled. She knew from Walker's description what his mother was suffering from, and that kind of medicine was wanted. Asked whether she was in the habit of mixing medicines, witness said Mr. Jotham always handed her a paper stating what medicine she was to "put up." She was not in the habit of mixing medicines. She knew, from conversations she had had with Mr. Jotham over dinner and at other times, that he had called occasionally to see deceased.

Further questioned by the Jury, she said in ordinary cases she "put up" the medicine, but in special cases Mr. Jotham did it himself. There was no entry made in any book of medicines supplied to club patients, neither had Mr. Jotham any report to make on the subject. Club patients should bring their own medicine bottles, and if they did not she put the medicine in any bottle she might have.

The Coroner: Does Mr. Jotham prescribe for a patient on the mere statement of anyone who comes to report a case to him?—He asks what is the matter, and if he isn't able to go he "puts up" the medicine.

The Coroner: Really. Well, I am astonished. I am very sorry for Mr. Jotham's patients if that is the case.

Mr. Gee: Do I understand if twenty patients come and say they have a cough, you give them all the same medicine?—Yes, if the complaint is the same. There are different bottles for different complaints. There are a whole row of large bottles for different complaints, and I feel quite competent to give out the medicine. He tells me what quantity to give out of the different bottles—in this case he told me "half and half"—out of two bottles.

Mr. Geo. Bland, surgeon, said he made a *post-mortem* examination of the body, and found deceased had been suffering from emphysema of the lungs and bronchitis, and that the valves of the heart were very much thickened. The stomach was healthy and contained

about a pint of pale brown fluid. The other organs of the body were healthy. In his opinion death was caused by bronchitis, complicated by heart disease.

The Coroner: Is the medicine in that bottle the sort of medicine you would have given, having regard to the age of the woman and all the circumstances?—I do not know the contents of the bottle. It seems to be an ordinary cough mixture.

Mr. Lockitt: Do you think there was anything in the contents of the bottle to cause death?—Judging from what I have heard of the evidence, I should say the medicine had nothing to do with the death. She was dying when she took it.

Mr. Bullock: Is it your opinion she was neglected?—I can't say that.

The Jury eventually returned the following verdict:—"We are of opinion that deceased died from natural causes. We also agree that Mr. Jotham's conduct deserves severe censure for his gross carelessness in not attending to the deceased. We also believe that Mr. Jotham did not see deceased on December 22, as stated in his certificate."—*Macclesfield Courier.*

Poisoning by Laudanum.

Mr. J. Hewetson Brown, Coroner for the city of Carlisle, held an inquest, on Monday, touching the death of James Edwin Green, from a quantity of laudanum which he swallowed on Saturday night in the Victoria Hotel bar, Citadel Row. It appeared that the deceased, who had been a polisher and van-man, had been discharged from his situation about a month ago, a circumstance which is said to have preyed on his mind. On Saturday last he was in the bar of the Victoria Hotel, in Citadel Row, under the influence of drink. While there he borrowed an empty bottle from the barman, and sent a friend for twopennyworth of laudanum to the chemist's shop of Mr. Pattinson, in the Crescent. On the laudanum being brought the deceased poured it into a glass and drank it. After the lapse of some time medical help was obtained, but Green died about eleven o'clock. Evidence to the foregoing effect having been given,—

John Pattinson Little, assistant to Mr. Pattinson, chemist, of the Crescent, said he was not a qualified assistant chemist. The witness Scholes, whom he knew, came for twopennyworth of laudanum on Saturday afternoon. He supplied him with it and labelled the bottle "poison." He did not make inquiry as to whom and for what purpose Scholes wanted the drug. Laudanum was not one of the poisons registered under the Pharmacy Act, 1868. About half an hour afterwards he again saw Scholes, who said Green had taken the laudanum and they did not know what to do with him. He told Scholes to get a doctor as soon as possible and keep Green awake. He knew Green, and he was not in the habit of getting laudanum. He supplied Scholes with about half an ounce of laudanum. He was quite aware that it was sufficient to kill a man.

A Juror said he thought witness had acted carelessly.

Witness did not think so. Sometimes a pint at a time was sold.

The Juror: Yes, but to persons whom you know.

Witness: Well, I knew this man.

Medical evidence was given that death had resulted from an overdose of laudanum, and the Jury returned a verdict that "Death was caused by an overdose of laudanum taken in ignorance of its results or effects."—*Carlisle Journal.*

Supposed Death through taking a Patent Medicine.

An inquest was held at the County Court House, Stowmarket, on Friday, January 12, before A. F. Vulliamy, Esq., Coroner, touching the death of Sarah Scurrah. The nephew of the deceased said his aunt had complained of tightness of the chest, and on the evening of Tuesday, January 9, she was so much worse that he obtained medical advice. When Dr. Groome arrived he at once pronounced her to be dying. Some brandy and water was administered and other remedies applied, but in a few hours she expired. Deceased had frequently refused to allow him to send for a medical man. She took some patent medicine which she had by her the day before her death.

A nurse, called in to attend the deceased on Tuesday evening, said she was unconscious the whole of the time until her death.

Mr. Thomas Wilson, chemist, Stowmarket, supplied the nephew with some soothing medicine for the deceased, consisting of a mixture of bromide of potassium and aromatic spirits of ammonia. The bottle contained full directions as to how it should be taken.

Inspector Simkin produced two bottles of medicine, from both of which he had been informed the deceased had taken some.

Dr. W. W. Groome said he was called in to see the deceased on Tuesday evening. She was perfectly insensible. Her skin was cold, and her face was covered with sweat; the pupils of the eyes were contracted and insensible to light, the pulse was quick and feeble, and her breathing was rather noisy. Having been shown the medicine which she had taken he came to the conclusion that she was suffering from the effects of opium. The label of the bottle contained the words "Not to be taken by children," and from that fact he should say it contained opium or morphia. He was of opinion that she died from opium poisoning. In a person of her age a small dose might produce considerable effect.

The inquiry was adjourned in order that a *post-mortem* examination, and an analysis of the contents of the stomach and patent medicine, might be made.—*East Anglian Daily Times.*

Review.

A Handbook of Cinchona Culture. By Karel Wessel van Gorkom, formerly Chief-Inspector of Cultures in the Netherlands East Indies. Translated by Benjamin Daydon Jackson, Secretary of the Linnean Society. London: Trübner and Co. 1882.

In this work of nearly three hundred pages the author has given the results of his experience in the cultivation of the cinchona plant in Java whilst acting as Director of the Dutch Government Cinchona plantations. The successful cultivation of the cinchona in Java was first attained under Heer van Gorkom's Directorship, during 1864 to 1875, for when he succeeded Junghuhn in 1864 the Java plantations were in a very languishing condition. Hasskarl's seedlings had been proved to be chiefly the inferior species of cinchona, *C. Pahudiana* (*C. ovata*), of which 531,456 were, at the end of 1863, under cultivation in the open ground, whilst the plantation only contained 7408 calisaya plants. But in 1864 the cultivation of *C. Pahudiana* was restricted, and special attention given to the more valuable species of *C. Calisaya*, and the success of the plantations was assured by the planting out in 1866 of 12,000 young Ledger plants that had been raised from seed obtained from Mr. Ledger in 1865. Since 1872 *C. Ledgeriana*, *C. officinalis* and *C. succirubra* have been exclusively propagated, with the result that in 1880 the plantations contained 498,000 Ledgeriana, 401,000 officinalis, and 278,000 succirubra plants.

The earlier chapters contain the history of the cinchona, its botanical description, an account of its introduction into Java, and of the species and varieties cultivated there. Under the head of Chemical Investigation we find a short account of the cinchona alkaloids, and the

results of Moens' analyses of the three species under cultivation, whence it appears that in 1879—

	Total alkaloids. min.	max.	Quinine. min.	max.	Net weight of bark in ½ kilos.
Ledgeriana gave	6·1	8·1	6·0	7·0	7850
Officinalis ,,	5·3	6·8	1·2	4·6	3365
Succirubra ,,	6·0	8·0	0·6	0·9	25,201

It is to be regretted that in these analyses no details are given of the other alkaloids.

In 1878 Moens showed by an analysis of the outside scrapings or shavings of Ledgeriana, that the old method of the cascarilleros, which consisted in depriving the thick branches of their epidermis, was a costly operation, for in the samples of shavings he found 9·5 and 7·5 per cent. total alkaloid, containing 8·3 and 6·7 per cent. quinine respectively.

By the scraping process Moens and Scheffer ascertained that a kilogram of superior bark could be obtained annually from each tree; the author considers, moreover, that scraping might be done once or even many times with good results, but skill is required to prevent injury to the tree.

In Java, as it is now found in Ceylon, no variety of cinchona can be cultivated with better prospects of speedy and ample production than the succirubra; but the author is of opinion that so long as quinine is of primary importance, there can be no satisfaction in the exclusive cultivation of the succirubra.

The amount of alkaloids in the bark does not regularly increase with the age of the tree, and in normally developed trees, the maximum amount of alkaloids will be in trees from six to eight years old. The author does not regard the process of renewing under moss to be applicable to inferior kinds of cinchona; as is now well known, its effect on succirubra is to increase the yield of quinine and to decrease the cinchonidine, and on officinalis to suppress in most cases cinchonidine entirely.

In chapters IX. and X. are fully described the cultivation of cinchona, its propagation by seed, and the gathering and keeping of the seed; and in chapter XI., its artificial propagation by cuttings, with a description and full size illustration of Venleman's method of side grafting Ledgeriana on succirubra stems, which was first carried out in 1879. On this point we read, "For scions young twigs of Ledgeriana trees are taken, those with one joint are large enough, though as there are no reasons for extraordinary economy it is better to use tops of branches with two or three joints. The woody stem of a young succirubra plant serves as a stock, preferably a seedling, because cuttings usually possess a less developed root system. Succirubra stems as thick as a lead pencil offer sufficient surface; stronger stems may perhaps supply more nutriment to the scions, but it is an advantage on the other side that the diameter of stock and scion should agree, that the opposed barks may be united as completely as possible."

The best results are expected from this method, and it has the further advantage of requiring no propagating houses, and of being applicable after cropping an inferior cinchona plantation.

A detailed account is given as to the erection of propagating houses, laying out the beds and preparing the ground and nurseries, and as to the nature of the soil and the space between the plants.

With the exception of a species of beetle, *Bostrichus* or *Dermestris*, which attaches itself chiefly to the sickly and transplanted trees, and a yellowish-brown larva, the only serious plague is "cinchona rust," which seems to be allied to the "tea rust," and is due to *Helopeltis theivora*. Cutting out and burning the prunings is at present the only known remedy to this formidable pest. In the Malawar mountain ranges eight-tenths of an officinalis plantation was rendered worthless by the repeated attacks of the *Helopeltis*.

Interesting details are given as to harvesting the bark, regarding which it is stated that the planter loses by harvesting too early, for the amount of bark obtained in eight years would be doubled in the four succeeding years; also on stripping and drying and on sorting and packing the bark.

In chapter XXII., we read, with regard to the preparation of the quinetum in Bengal, "It appears a deplorable fact that the extraction from the bark is very incomplete, for one-half of the alkaloids go to waste. It appears from the report for 1879 that things are not more fortunate in Java. In the Chemical Laboratory at Weltevreden, from 3000 kilos of succirubra bark, which positively averaged 6 per cent. of alkaloids, there were not more than 56 kilos of quinetum made."

The subsequent chapters do not merit special notice; indeed, some of them might have been omitted with advantage, especially those on the artificial preparation of quinine and on the quinine alkaloids. In the former chapter we are informed that "it has even happened in Germany that an actual artificial fabrication of a cinchona alkaloid has been effected, but it possessed no polarizing power, therefore not identical with the natural production and decidedly differing in other properties," and in the other we are impressed with the belief that the chemical part of the subject has not been thoroughly grasped by the translator. To us, some parts are perplexing, but to the planter, who desires information on the chemistry of the cinchona alkaloids, we fear they would be sorely misleading. On page 215 we meet with "a new quina-basis," "chamæleon mineral," and on page 271 with "an alkaloid which is accumulated in the amorphous basis, and is probably fugitive." In several instances we should have preferred to have had the author's meaning given in equivalent English, rather than "as close a rendering of the original as possible and to run the risk of occasional awkwardness."

Enough has been said, we think, to show the value of Heer von Gorkom's work to cinchona planters, and to others interested in the cultivation of the cinchona plant.

BOOKS RECEIVED.

British Homœopathic Pharmacopœia, published under the direction of the British Homœopathic Society. Third Edition. London: E. Gould and Son. 1882. From the Publishers.

A Manual of Photographic Chemistry, Theoretical and Practical. By Rev. T. Frederick Hardwich, M.A. Ninth Edition, edited by J. Traile Taylor. London: J. and A. Churchill. 1883. From the Publishers.

A Manual of Nursing, Medical and Surgical. By Charles J. Cullingworth, M.D., etc. London: J. and A. Churchill. 1883. From the Publishers.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Permanganate of Potash Pills.

Sir,—As these pills have formed the subject of a letter from Mr. Martindale, it might be of interest to some to know of another process. Before his letter appeared, we had occasion to make some of these pills, each containing 2 grains of the salt. The senior apprentice had them given him to do his best with, when, after some failures, he found they were easily made by rubbing the salt first with a little simple syrup, then adding about 2 grains of powdered sugar to each pill.

45, *Forrest Road, Edinburgh.* James Mackenzie.

Communications, Letters, etc., have been received from Dr. Castle, Messrs. Moyse, Oliver, Lawrence, Umney, Wood, Lambie, Baldock, Nemo, Quærens, Devonia, A. P. S. (Hobart Town).

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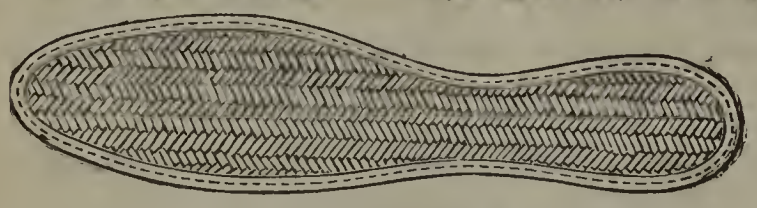

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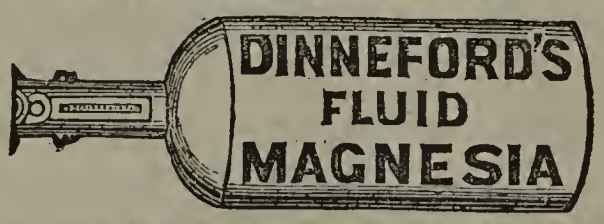

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India Office, 4th January, 1883.

NOTICE is hereby given, that an Examination of Candidates for five appointments as Surgeon in Her Majesty's Indian Medical Service will be held in London on the 19th February, 1883, and following days.

Copies of the Regulations for the Examination, together with information regarding the Pay and Retiring Allowances, &c., of Indian Medical Officers, may be obtained on application at the Military Department, India Office, London, S.W.

E. NEEL, for Military Secretary.

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14 presented themselves at the Minor Examination from this School, the following **11** passed:—

*Mr. C. BING.	Mr. J. T. LAMBERT.
* „ G. BRISLEY.	* „ F. C. LANGLEY.
* „ A. HOLWELL.	* „ C. L. PERKINS.
* „ W. R. HOPKINS.	* „ C. RIDGLEY.
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*Mr. G. RIGDEN.

* These gentlemen passed the first time of their presentation.

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FOURTEENTH SESSION, 1882-3.

THE NEXT TERM WILL COMMENCE ON APRIL 15, 1883.

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JUNIOR. Age 26. Last engagement 4 years with surgeon. Good references. Strictly sober and steady. Salary no object. T. WALKER, 1, Picton Pl., Newcastle.

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A PERMANENCY as MANAGER or ASSISTANT. Well up in Dispensing and Prescribing. Varied experience. Age 32. Height 5ft. 8in. Disengaged. ALPHA, Victoria St., Wolverhampton.

LOCUM TENENS or Temporary ASSISTANT. Qualified. By the day, week, or month. Town or country. CHEMICUS, 6, Manchester St., Gray's Inn Rd., W.C.

IMMEDIATELY.—As JUNIOR. Used to good class business. Height 5ft. 7in. Age 19½. 5 years' experience. Good references. Particulars to T., 9, Charles St., Brighton.

ASSISTANT, out-door, qualified, requires a permanency, or to MANAGE a Branch. Town and country experience. Age 30. R. B., 237, Amhurst Rd., Stoke Newington, N.

ENGAGEMENTS WANTED.

AS Junior Assistant in a good Dispensing business, where two or more are kept. Disengaged February 1st. Height 6ft. Age 20. Excellent reference. State hours, &c., to Junior, Mr. Morris, Chemist, Brecon, S. Wales.

TO Wholesale Druggists.—A gentleman of experience desires re-engagement as Traveller. Highest references. Scammony, care of Mr. Napier, 56, South St., Exeter.

A YOUNG man, aged 20, wishing to attend lectures, offers his evening services in return for board and lodging. 3 years' experience. South London preferred. E. R., 72, High St., Sittingbourne.

PARTNERSHIP.—A qualified chemist desires a situation as Manager or Assistant, with the prospect of a partnership. Aged 33. Satisfactory references. R., 8, Osborne Ter., Clapham Rd., London.

AS Manager to Branch or Assistant. Age 30. Height 5ft. 10½in. Minor and Hall qualifications. F. S., 49, Penrose St., Walworth, S.E.

AS Assistant or Junior. In light Retail and Dispensing. London or South Coast preferred. Aged 23. Height 5ft. 10in. Nearly 5 years' experience. Steady and trustworthy. A comfortable home appreciated. Excellent references. A. B., 48, Harmood St., Kentish Town, N.W.

AS Senior. Minor qualification. Accustomed to first-class Dispensing and Retail. London preferred. Exceptional references. X. Y. Z., 86, King's Rd., Brighton.

AS Junior, in or near London. Time for study preferred. Age 19. Passed Preliminary. H. G. B., care of Mr. Swift, 33, Chatsworth Rd., Clapton Park, E.

AS Junior Assistant or Improver. Just completed apprenticeship. Age 18. Small salary. Disengaged. A. Gregory, 77, Upper Arundel St., Portsmouth.

AS Assistant in good class Dispensing and Family Retail business. Out-door. State salary, hours, &c. Chemist, Mr. Rosindale, Briggate, Leeds.

IMMEDIATELY.—As Assistant or to Manage a Branch. Age 30. Good references. A permanency desired. Married. Alpha, 23, Bankhouse St., Burnley.

AS Junior or Improver. 3 years' experience at a large Dispensary. Age 19. Excellent references. Town or country. F. S., 7, Winchester Rd., Buckland, Portsmouth.

ASSISTANTS WANTED.

WHOLESALE.—A Warehouseman. Must have thorough knowledge of his work. Apply, stating previous engagements, references, and salary expected, to Y. & Co., care of Messrs. Horner & Sons, Mitre Sq., London, E.C.

AN Assistant. In-doors. Where another is kept One accustomed to a light busy Retail and Prescribing business preferred. Character and antecedents must bear the strictest investigation. Apply T. S. Beckett, 67, Victoria Dock Rd., London, E.

IN-DOOR Assistant. About 22. Thoroughly competent to Dispense, accustomed to good class country business, writes a good hand, steady, trustworthy, of good appearance and address. Churchman. Senior, apprentice, &c., kept. Applicants not replied to within a week consider declined. State age, height, salary, references, with carte, to Thomas Sellors, Chemist, Coventry.

A COMPETENT Assistant. About 24 years of age. Apply, stating usual particulars, to T. M. Deighton, Pharmaceutical Chemist, Bridgnorth.

ASSISTANTS WANTED.

AN Assistant, to proceed to India. Age about 26, and unmarried. Must have passed Minor examination. Four years' agreement. Salary, 1st year 150 rupees, 2nd year 200 rupees, 3rd year 225 rupees, 4th year 250 rupees per mensem. Apply, by letter only, to Messrs. Alex. Lawrie & Co., 14, St. Mary Axe, London, E.C.

PILL-COATERS.—Steady work for good workmen. Address, Pill, care of Lee & Nightingale, Advertising Agents, Liverpool.

SOUTH Africa.—A qualified man, of good address, between 30 and 40, as Senior in a Retail business. Married preferred. Applications, with references, which must be unexceptionable, to B. G. Lennon & Co., 11, Edmund Pl., Aldersgate St., London, when particulars will be supplied. Applications not answered in a week may be considered declined.

TRAVELLER, by a Wholesale Drug house in the provinces. Good opportunity for an energetic man. Apply, with full particulars as to age, experience, and salary, to Road, care of Messrs. Howards & Sons, Stratford.

APPRENTICE.—A gentlemanly youth, about 16 or 17, having passed, or competent to pass, the Prelim. exam. of the Pharmaceutical Society. Comfortable home, and every opportunity for acquiring a thorough knowledge of the business. Apply to Arthur I. Joseph, English and Foreign Chemist, St. Leonards-on-Sea.

SHORTLY.—Qualified Assistant. In-doors. About 25. Accustomed to good class Retail and Dispensing. Apply, if convenient, or send carte with particulars of age, height, salary, &c., to J. Beddard, 46, Churton St., Belgrave Rd., S.W.

AN out-door Assistant. Age 24. Apply 94, Whitechapel Rd., before 12 or after 6 p.m., by 1st February.

IMMEDIATELY.—A trustworthy Assistant. Unmarried. Out-door. For an old-established Retail. One possessing good business abilities. No Sunday duty. Address, stating salary required, experience, age, height, and when disengaged (enclosing carte if convenient), to Sprent & Biddles, Reading.

BY a Surgeon, near London. A young man as Dispenser and Bookkeeper. The duties being light there is plenty of time for reading. Salary 25s. per week, out-door. Address, C. S. R., care of Messrs. Wyman & Westwood, 25, Charles St., Farringdon Rd., London.

PARENTS and Guardians.—A well educated youth. One who has passed the Prelim. exam. preferred. In a good class Retail and Dispensing business. Comfortable home and every opportunity for thoroughly learning the trade. Premium required. Address, G. Sherriff, Chemist, Paignton, South Devon.

AN Assistant, of good experience and address, for a Dispensing and light Retail business. One only kept. With Minor qualification preferred. Apply, stating previous engagements, references, salary required, &c., and enclose carte, to W. H. Davison, High Street, Hastings.

JUNIOR Assistant. Of good appearance and address. Accustomed to the best class of Dispensing and Counter trade. Must write a good hand. Apply, stating previous experience, age, salary expected, and enclosing carte, to Edward Pearson, Chemist, Nottingham.

JUNIOR Assistant. Accustomed to Dispensing. Must be quick and accurate. One who has just completed apprenticeship in a country business not objected to. Send photo. if convenient, with full particulars, to J. W. Feltwell, 91, Hammersmith Rd., West Kensington, W.

AN Assistant, accustomed to Dispensing, with Minor qualification. Apply, personally or by letter, to Bradley & Bourdas, 48, Belgrave Rd., S.W.

ASSISTANTS WANTED.

A JUNIOR Assistant for Dispensing and light Retail business. Apply R. Hiscock, 17, Broad Gate, Coventry.

AN Assistant. Accustomed to Dispensing and select Retail business. Age not under 22 years. Apply, with full particulars, to J. P. Boyce & Son, Pharmaceutical Chemists, Weybridge.

A STEADY, industrious, and obliging young man, as Junior Assistant. Must be able to Dispense, and give references as to character, &c. Address, John Ing, Chemist, High St., Aldeburgh, Suffolk.

EARLY in February.—A competent Assistant. About 21 or 22 years of age. For a Dispensing and Family business. Must be a neat and accurate Dispenser, and have passed the Preliminary. One seeking a permanency preferred. A. Greenall, 10, South Rd., Waterloo, near Liverpool.

A TRUSTWORTHY Assistant. Accustomed to good class trade. Must be a neat writer and accurate Dispenser. One who has passed his Minor preferred. Apply, stating usual particulars, and enclose carte, to J. Cornelius, 11, Regent Pl., Teignmouth.

AN Assistant. In-door. Minor qualification. State age, height, and salary expected, and enclose carte, or personal application preferable. Apply T. P. Hickey, 297, Edgware Rd., London, W.

ASSISTANT. About 23 years of age. With or without Minor qualification. Experienced Dispenser and accustomed to good class Retail. Apply by letter, stating salary, height, and full particulars of previous engagements, to Vines & Froom, 75, Aldersgate St., E.C.

WEST London Hospital, Hammersmith, W.—An Assistant Dispenser. Salary commencing at £70 per annum. Furnished apartments, fire, light and attendance. No board. Candidates, unmarried, aged not more than 26 years, and possessing the Minor qualification, preferred. Attend with testimonials at meeting of House Committee, Monday, 29th instant, at 10.30 a.m.

R. J. Gilbert, Secretary, &c.

SURREY Dispensary (President the Right Hon. the Earl of Egmont).—Assistant Dispenser required. A meeting of the Monthly Committee of this charity will be held at the Dispensary, Great Dover St., on Tuesday, the 23rd inst., at 6 o'clock precisely, to appoint an Assistant Dispenser. Gentlemen desirous of becoming candidates for the same are required to be in attendance as above to produce testimonials and necessary qualifications either from the Pharmaceutical Society or the Apothecaries' Hall. Salary £60 per annum. The duties consist in dispensing and compounding medicine for the patients between the hours of 9 a.m. and 2 p.m., or until the business of the morning is finished. Any further particulars can be obtained either at the Dispensary, or of

Francis J. T. Moore, Secretary.

98, Cannon St., 17 January, 1883.

CURTIS & Co., 48, Baker St., W., require a gentlemanly Assistant, thoroughly conversant with Dispensing, and writing a good hand. Age not under 24. Carte and particulars kindly forward.

A COMPETENT Assistant, accustomed to good class business. Age 25 to 30. One seeking a permanency preferred. In-doors. N.B.—If by letter state full particulars. Apply to W. Pinyon, Chemist, 49, Abbey Rd., St. John's Wood, N.W.

AN Assistant. Out-door. For a country business. Under 24 years. State height, age, salary, and reference from last employer. Letters not answered in three days may be considered declined. E. G. Carrington, Bakewell.

ASSISTANTS WANTED.

IMMEDIATELY.—A good Junior. Must be able to Dispense, and have good character for honesty and steadiness. Churchman preferred. State age, height, salary, and enclose carte. C. F. Smart, Chemist and Stationer, Littlehampton.

A COMPETENT Assistant, who can speak Welsh. Apply to J. H. Smith & Co., Chemists, Carmarthen.

BY a Pharmaceutical Chemist, in one of the chief cities of Ireland, a thoroughly qualified Dispensing Assistant, to take charge of the Compounding Department. Must be accurate, and bearing first-class testimonials. Application by letter, addressed L., care of Messrs. Hodgkinsons, Stead & Treacher, 198, Upper Whitecross St., E.C.

A COMPETENT Assistant. Gentlemanly and good address. Age 24 to 30. Apply, J. Hill, 1, Castle St., Reading.

SHORTLY.—A competent Assistant, qualified by examination, for a first-class business, where three assistants are kept. Address, stating age, height, salary required and references, and enclosing carte, to be returned, to E. H. Metcalfe, Malvern.

EARLY in February.—An active and obliging Assistant, to Manage a Branch business. Must be of steady habits. To live in-doors and take sole charge. House furnished. Hours moderate. No Sunday duty. Apply to S. J. Coley, Chemist, Stroud, giving usual particulars.

AN Assistant for a first-class Dispensing business. Minor qualification. Must be a quick and accurate Dispenser, and of gentlemanly appearance and manners. Address, with usual particulars, and if possible carte de visite, to be returned, to Walter Wright, 47, High St., Exeter.

IN a good class Mixed Country trade. A steady and obliging Assistant. Age about 23. Hours 8 to 8. No Sunday work. Comfortable home. References as to sobriety, &c., must be unexceptionable. Preference given to those enclosing photo, which will be returned. Salary, references and particulars to A. Wright, Chemist, Olney.

IMMEDIATELY.—A respectable young man, about 18 or 19, with not less than 3 years' experience. Must be steady, willing, and obliging. Address, stating age, height, and references, to J. Holloway, Post Office, Finsbury Rd., Wood Green, N.

BY 24th of this month.—As Second Assistant. Age about 23. Middle height. Minor or Hall qualification. Accustomed to superior class of business. Experienced Dispenser. Good writer. Business hours, 8 to 8.30. Allowed one night a week, from 5.30 to 11, and another night from 9 to 11; whole of every other Sunday. Commencing salary £45. Useless writing. Must apply personally, morning, 10 to 12, evening, 6 to 8. White & Son, 19, Park Ter., Regent's Park.

IMMEDIATELY.—A Junior Assistant, about 22 years of age. Must be a good Dispenser. One requiring three hours daily for study could be treated with. Apply by letter, with full particulars as to age, height, experience, references, and salary required, C., Messrs. Field & Co., 112, Camden Rd., N.W.

IMMEDIATELY.—A Junior in a Mixed country business, with good Retail and Dispensing. Out-door. Apply, stating full particulars, to Spong & Son, Chemists, Biggleswade, Beds.

A JUNIOR Assistant. In-door. Active and good address. Must be a good Dispenser. State usual particulars and salary required to J. Baily, 44 Hampstead Hill Gardens, N.W. Applications not answered in 4 days may be considered declined.

ASSISTANTS WANTED.

AN Assistant. In-door. A competent Dispenser and used to first-class retail. J. Barnes & Son, Pharmacists, Preston.

A JUNIOR Assistant. Not under 21 years of age, Apply, stating age, reference, and salary required, to Foster & Else, Brighton.

CURRY, LLOYD & Co., Druggists' Sundriesmen, Bristol, require a Stock-keeper. A knowledge of the business necessary.

IMMEDIATELY.—A thoroughly competent Dispenser. Good writer. Apply, with carte and usual particulars, Jameson & Curtis, Hastings.

IMMEDIATELY.—A Junior Assistant. Must be well up in Dispensing, of good address, and produce satisfactory references. Apply, stating salary required, &c. (enclosing carte if convenient), to A. Smart, 22, The Common, Woolwich.

IMMEDIATELY.—An Assistant. Age about 23 years. Must be a careful Dispenser and willing to make himself generally useful. One only kept. Apply to B. Knight, Pharmacist, Torquay.

BUSINESSES FOR DISPOSAL.

JERSEY.—A ready-money Business. Shop large and well stocked. Splendid position. Facing entrance of new market. Old established. Good prices. Many valuable recipes. Pharmacy Act does not extend here. Proprietor retiring from business. Address, for price and full particulars, A. F. Elliston, Chemist, St. Heliers.

THE Oban Apothecary Hall and Ærated Mineral Waters Business.—The long and well established Business of the late Mr. John Hunter, Chemist and Druggist, Oban, is for sale by private bargain. In addition to the business of Chemist and Druggist the Ærated Mineral Waters Business is wide and extensive. Particulars regarding the same will be given and offers will be received by Donald Macgregor, Solicitor, Oban, up to 10th February, 1883.

LONDON, N.—The proprietor of several Chemists' Shops, carried on by Assistants, at full prices, is open to negotiate sale of same. Returns each about £600. Prices ranging from £600 to £800. Address, in first instance, to Chemist, care of Messrs. Newbery & Sons, 1, King Edward St., Newgate St., London, E.C.

IN one of the best thoroughfares in Worcester.—A small and convenient Chemist's Shop with house. Drugs and fixtures to be had at a low valuation. No other shop in the district. Apply to Messrs. Griffiths & Millington, Auctioneers, &c., Worcester.

RE L. T. GOUCHER, of 265, Glossop Rd., Sheffield, Chemist and Druggist, and Wine and Spirit Merchant.—To be sold by private treaty, the stock-in-trade, fixtures, fittings and utensils of the above Business. There is a Gilbey's Agency for sale of Wines and Spirits attached to the premises, also a lease of same, of which about 9 years are yet unexpired. The turnover has been upwards of £2000 per annum. For further particulars and to treat apply to Mr. G. R. Neill, Accountant, College St., Rotherham, or to Messrs. Camm & Corbidge, Chartered Accountants, Norfolk St., Sheffield.

IMMEDIATELY.—In a country town. An old established Business. Mixed trade. No opposition. Full prices obtained. Death of proprietor the cause of sale. Net profits average over £300 per annum. Price £800. Part may remain on approved security. Several profitable agencies would probably be transferred to the purchaser. These are not included in the profits. Also a Drapery trade attached, yielding £250 net profit, to be sold for valuation of stock and fixtures. The businesses may be sold together or separately. Apply, H. Gadd, 97, Fore St., Exeter.

BUSINESSES FOR DISPOSAL.

£300 cash.—A Retail Chemist's Business. In the West-end of London. Returns £320. Rent 21s. a week. Lock-up shop and good parlour. First-rate opening for a Surgeon. Apply, by letter only, to W. R. G., 17, Bloomsbury Sq., London, W.C.

MIDLANDS.—Less than value. Stock and fixtures. Returns £1600. No heavy trade. 20 years present hands. Extensive premises. Rent £55. This presents rare opportunity of acquiring a sound business at small outlay. Also, others in all parts from £100 to £2000 purchase-money. Apply, Hine Gilbert, 17, Hart St., Bloomsbury.

AT once.—Thorough death. A Retail and Prescribing Business. Doing at present £4 a week in the hands of an Assistant. Could be easily doubled by an energetic and pushing man who would personally attend to it. It is situated in a populous neighbourhood, with no near opposition. Rent of house £28 a year only. Apply at 146, Mile End Rd., London, E.

£2000 returns (over).—General Retail, Prescribing, and fair amount of Dispensing. In country town, West. Centre of good class district. Established 50 years. Profits good. In consequence of vendor joining a wholesale firm. The above is offered at £150. Goodwill, stock and fixtures, valuation £600. Orders to view of F. J. Brett, Valuer, Leicester.

LONDON.—In important rising suburb. A good class, light Retail and Dispensing Business, with some good proprietary articles. Nicely fitted pharmacy and very good house. On lease. Returns about £900, and capable of great extension. Applicant must furnish satisfactory references. Address, Bona Fide, Abbott's Agency Office, Eastcheap, E.C.

LIGHT Retail and Prescribing Business. Marketing thoroughfare, large and increasing neighbourhood. Good house in thorough repair, rent £55. Shop well fitted and stocked. Returns over £8. Profits £5. Worked by an apprentice, principal could double it. Price £400 or offer. Part can remain. Address P. M. 38, Messrs Deacon's, Leadenhall St.

MANCHESTER.—To be sold, freehold shop, house and premises, which carries with them the goodwill of one of the oldest Businesses in the centre of the town. Excellent opening for druggist who can practice Dentistry and Prescribe. Price £5000, of which £3500 may remain on mortgage. Early possession can be given. Application by principals or their solicitors only to Withington, Petty & Boutflower, Solicitors, Spring Gardens, Manchester.

ST. HELIERS, Jersey.—Immediately. Prescribing, light Retail and Dispensing. In centre of main business street. Elegantly fitted shop. Glasgow patent recess-labelled bottles, glass labelled and knobbed drawers. Well stocked. Satisfactory reasons for disposal. For particulars address, T. Parsonson, 16, King St., St. Heliers. N.B.—Qualification not necessary.

IN one of the best positions in the Staffordshire Potteries. Through the recent death of the proprietor. The friends are prepared to accept an offer for immediate settlement for an old established ready-money small class Business. Returning £500 yearly. Mainly consisting of Prescribing, Tooth Extraction, &c. Conducted since October by an Assistant. Particulars of W. R., 31, Bernard St., Russell Sq., London, W.C.

IMMEDIATELY.—In one of the principal thoroughfares of Newcastle-on-Tyne. An old established light Retail and Dispensing Business. In thorough working order. Good profits. Lease of 9 years to run. The proprietor is disposing of this in consequence of succeeding to a business in the south. Further particulars from T. J., Messrs. Barron, Squire & Co., Bush Lane, London

BUSINESSES FOR DISPOSAL.

MESSRS. GURDEN BERDOE have for transfer:—SURREY. Totally unopposed Retail. Same hands 26 years. Selling through infirmity. Returning £300. Can be doubled. Lease yields £10 profit rental. Rare opportunity. GLOUCESTERSHIRE. Retail and little Stationery. Unopposed. Returning £750. Rent £25. £500. S. DEVON. Returning £550. Full prices. £450. EASTERN COUNTIES. Old established Family Trade. Returning £900. ESSEX. Nine miles out. Rare opportunity for Dentist or Prescribing Chemist. Returning now £5 weekly. £200, or offer. N.W. Unopposed Dispensing and Retail. Returning £650. For £500. N. Handsomely fitted. Showing £350 net profit. Excellent house. £700. Another. Returning £450, under manager. Same hands 7 years. Only £275. Also, SOUTH COAST (not Brighton). Genuine old established high class Trade. Same hands 40 years. Retiring. Cash required £1800. Please apply, 30, Jewry St., Aldgate, City.

AN old established Retail, Dispensing and Prescribing BUSINESS. In a good market town in Wiltshire. Price about £300. For further particulars, apply to CHEMICUS, care of Messrs. Barron, Harveys & Co., Giltspur St., London, E.C.

A BARGAIN. — Profitable old established Retail Chemist's BUSINESS. In London. Receipts under management, £5 to £6 weekly. Opening for Dentistry. Stock, fixtures, goodwill and long lease. Price £150. Rent £45. Let off £20. Apply, S. T., care of Barclay & Sons, 95, Farringdon St., London, E.C.

A VERY desirable, profitable, easily managed, good class country light Retail Family and DISPENSING. Delightfully situated. Good market and manufacturing town. Full prices. Changed hands once in 42 years. Returns for last 3 years £2814. Net profit £1231. Returns last year nearly £1000. Increasing. One hour's rail south of Manchester. Introduction given. Genuine buyers address, PHARMACIEN, Messrs. Evans & Sons, Hanover St., Liverpool.

TO BE LET.

WAREHOUSE and LABORATORY. Both well fitted up. Lately occupied by a Manufacturing Chemist. Situate close to West Smithfield. Apply to Messrs. ORRIDGE, 30, Ludgate Hill, or Mr. DUNN, 19, Charterhouse Sq., E.C.

FOR SALE VERY CHEAP.

STOCK and Fixtures sufficient for small shop. Drugs, Bottles, Cabinets, Drawers, Scales, Pill Machine, and usual implements in trade. LINDEN, Broughton, Winchester.

A DOCTOR intends relinquishing his Open Surgery for a private residence, and desires to transfer it to a Chemist, or will entertain an offer for the fittings and fixtures alone, to be removed. Apply, by letter only, to Mr. FORSTER, 3, Fulham Pl., Paddington, W.

WYE HOUSE ASYLUM, Buxton, Derbyshire, for the Middle and Upper Classes of BOTH SEXES, is beautifully situated in the healthy and bracing climate of the Derbyshire Hills, and is directly accessible by the Midland and London and North Western Railways. For terms and other particulars, address the Resident Physician and Proprietor, Dr. F. K. DICKSON.

HENRY GADD,

Member of the Pharmaceutical Society,

CHEMISTS' TRANSFER AGENT,

97, FORE STREET, EXETER.

HENRY GADD having had many years' practical experience of the Trade, both in Town and Country, can offer his services for Transfers, Probate, Valuations, Arbitrations, &c.

HENRY GADD is instructed to offer valuable and old established businesses in London and the Country. Full particulars sent to bonâ fide purchasers upon receipt of trade card or reference.

Applications for either the purchase or sale of businesses inserted in Register free of charge.

FOR SALE.

THE Bottles and Fixtures of a Chemist's shop. Apply to S. R., 1, Crowndale Rd., Camden Town, London.

FOR SALE, BARGAINS.

20FT. mahogany top Counter, £8; 18ft. ditto, ditto, £7; 12ft. 6in. ditto, ditto, fitted with 24 drawers, £9; 9ft. 6in. ditto, ditto, fitted with 7 drawers, £6; 8ft. mahogany top Counter, 70s.; 6ft. ditto, 45s.; 5ft. 6in. ditto, 40s.; 10ft. mahogany top Cupboard, panelled doors, 3ft. 6in. high, 70s.; 7ft. 4in. mahogany Cupboard, glass doors, 3ft. 6in. high, £5 10s.; 7ft. 6in. mahogany top Counter, fitted with glass cases front, £6; 9ft. ditto, ditto, ditto, £7 10s.; 2 mahogany Cupboards, 3ft. wide and 4ft. high, 35s. each; 16ft. run Drawers, with cornice, shelving and pilasters over, bevelled edge labels, and glass knobs, £21; 12ft. ditto, ditto, £18; 11ft. run Drawers, with shelves over, £11; 4ft. 6in. ditto, ditto, £4; a large quantity of new and second-hand Drawers, very cheap. E. NATALI, 207, Old Street, near Pitfield Street, London, E.C.

SPONGE Cases, fig. A 43, £5; fig. A 41, 65s.; Desk and Cases, fig. A 31, 65s.; a 10ft. 3in. bent Plate-glass Counter Case, £9; a 6ft. 6in. ditto, ditto, £7; 6ft. ditto, ditto, A 18, £7; 5ft. ditto, ditto, £6; 4ft. ditto, A 17, 90s.; 4ft. ditto, A 16, 80s.; 3ft. 6in., A 16, 70s.; 3ft. ditto, 60s.; 2ft. 6in. ditto, 50s.; 6ft. ditto, ditto, A 7, £7; 3ft., fig. A 8, 40s.; a large number of other Glass Counter Cases, too numerous to mention in list; Plate-glass Dispensing Screens, 5ft. long, 6ft. long, 7ft. long, glass case at each end, with silvered glass centre, with marble slab in front, tablets on top, silvered glass backs, inside cases, and fitted with moveable shelves, very elaborate, £8 10s. each; a 8ft. Dispensing Screen, A 68; a ditto, ditto, 5ft. 9in.; Dispensing Screens, A 55, 5ft. long, £6; 6ft. long, £7; 4ft. 6in. long, with silvered plate-glass back inside, £7. E. NATALI, 207, Old Street, near Pitfield Street, London, E.C.

16FT. run Fixtures, 10ft. 6in. high, drawers, glass cases, lockers, shelving, &c., &c., £18 10s.; a 6ft. glass Wall Case to match, £15; 8ft. glass Wall Case, with glass cupboards under, £16; 3ft. 6in. glass Case for wall, 10ft. high, £8; nest of mahogany Drawers, gold labelled, with lockers under, 5ft. long, 5ft. high, 52 drawers, £5; 1 pair fancy iron Brackets for carboys, 40s.; a quantity Specie Jar and Carboy Stands, Show Steps and Stands, Perfume Stands, Soda Water Stands, Bottles, Jars, Carboys, Specie Jars, Scales, Lamps, Royal Arms. E. NATALI, 207, Old Street, near Pitfield Street, London, E.C.

THE entire Fittings for a Dispensary, consisting—Counter, with obscure glass on top, with sliding panel for passing medicines, &c., through; the Counter fitted with 15 large drawers, and screen fitted with shelving; at back of ditto, a sink and counter, fitted with cupboards, drawers, with shelves over, £20 the lot, a bargain. E. NATALI, 207, Old Street, near Pitfield Street, London, E.C.

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VALUATIONS.—In consequence of the increased demand for Mr. BRETT'S services as a Valuer, it is essential, to prevent disappointment, that engagements should be made early.

Businesses thoroughly investigated for Buyers.

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BIRMINGHAM.—Good class suburban RETAIL, with large sale of Homœopathic Medicines. Well fitted shop. Returns £450. Price £450.

LANCASHIRE.—Family Retail, Prescribing, and DISPENSING, situated in important town. Returns £1600. Many years in same hands, and open to full investigation. Bonâ fide buyer can be week behind counter. Goodwill £200. Stock and fixtures about £800.

LINCOLNSHIRE.—Unopposed village RETAIL. Neglected of late. Has returned £600, and can again. Price £60.

SURREY.—Unopposed good class village TRADE. Established 3 years. Returns £465, and improving steadily. Easy distance of town and Brighton.

HERTS.—Good country RETAIL, in pleasant town. Commanding corner. Returning about £500. At valuation—£300.

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(LATE TENCH & TAYLOR),

Licensed Valuers & Chemists' Transfer Agents,

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LONDON, E.C.

1. DERBYSHIRE.—Light RETAIL, with some Wholesale. Returns over £1300. Price £700. Part can remain.
2. LONDON, N.W.—Recently established BUSINESS. Returns £5 week; will soon be double. Price £200. A bargain.
3. YORKS.—Family Retail, Dispensing and PRESCRIBING. Returns £500. Price £360.
4. LONDON, N.—Profitable BUSINESS, in a first-class situation. Returns £600. Price £500.
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The Pharmaceutical Journal AND Transactions.

THIRD SERIES, No. 657.] SATURDAY, JANUARY 27, 1883. [PRICE FOURPENCE.

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The next EVENING MEETING will be held on Wednesday, February 7th, 1883, at Eight o'clock.

The Chair will be taken at half-past Eight *precisely*.

Papers intended to be read at that Meeting should be forwarded to the Secretary not later than Wednesday, January 31st, as papers received after that date cannot be announced in the *Pharmaceutical Journal* previous to the Meeting.

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The Board of Examiners for England and Wales meets at 17, Bloomsbury Square, London, in February, April, June, July, October, and December, and the Board of Examiners for Scotland meets at 119A, George Street, Edinburgh, in January, April, July, and October, for the purpose of conducting the above Examinations. Candidates must give notice to the Registrar in London, and pay the fee on or before the *first* day of the month in which the Examinations are held. Each candidate for the Major and Minor Examinations must, at the time of giving notice, produce a Registrar's Certificate of Birth, and a certified declaration that for three years he has been registered and employed as an Apprentice or Student, or has otherwise for three years been practically engaged in the translating and dispensing of prescriptions. Printed forms of declaration may be obtained from the Registrar in London. Each Candidate for the Modified Examination must state the number of the receipt for his declaration and his age at the time of giving notice.

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MESSRS. A. ROWLAND & SONS, OF 20, HATTON GARDEN, LONDON, beg to announce that their Macassar Oil can now be had in a Golden Colour, as well as in the usual tint. This Golden Macassar Oil is specially suited for fair-haired children and people. Sizes and Prices as usual.

ROWLANDS' EUPLYSIA

Is a botanical wash for cleansing the hair and skin of the head from all impurities, scurf or dandriff ; the application of the Euplysia (which is perfectly innocent in its nature) should be made on retiring to rest at night, a practice that will render the morning use of Rowlands' Macassar Oil increasingly effective both as to health and beauty of the hair.

2s. 6d. per Bottle.

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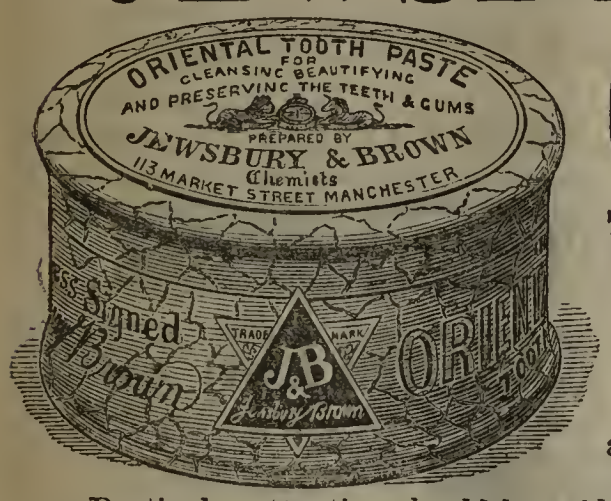
Is a beautifully pure, delicate, and fragrant toilet powder, and has lately been much improved. Each box has inside the lid a certificate of purity from Dr. Redwood, Ph.D., F.C.S., &c.

Sold in three tints: white, rose and cream, 2s. 6d. per Box; double that size with puff, 4s.

Counter Bills and Dummies can always be had on stating to what Wholesale House in London they may be sent for enclosure.

A. ROWLAND & SONS, 20, Hatton Garden, London.

JEWSBURY & BROWN'S ORIGINAL ORIENTAL TOOTH PASTE.



SOLD AT 1/6 & 2/6 PER POT.

This old-established Dentifrice has been **Fifty Years** before the public.

IT IS WARRANTED TO RETAIN ALL ITS VALUABLE PROPERTIES IN ANY CLIMATE.

The **ORIGINAL** and **ONLY GENUINE** is manufactured **solely by**

JEWSBURY & BROWN,

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and is distinguishable by the **AUTOGRAPH SIGNATURE** of the Proprietors on each wrapper and the **TRADE MARK** on the label round the pot.

Particular attention should be paid to this guarantee of genuineness, as **numerous imitations** are offered.

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Works:—Battersea, London, & Bromborough, Liverpool.

Price's Pure Glycerine for Medicinal Purposes.

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Price's Glycerine Soaps.

Price's Carbolic Disinfecting Soaps, for Nursery, Bath-room and Household Purposes.

Price's Carbolic and Glycerine Soap.

Hunyadí János

CAUTION.—Circumstances which have come to the knowledge of Andreas Saxlehner, Buda Pest, Sole Proprietor of the Hunyadi János Spring, compel him to WARN the British Public against SPURIOUS IMITATIONS. To secure genuineness, purchasers should see that every bottle has on the LABEL the name of

"THE APOLLINARIS COMPANY (LIMITED), LONDON."

FOREIGN
MINERAL WATERS.

FREDERICKSHALL (5 Cases, 6d. per Case less), 28/6 Case, 30 bots.; 40/- Case, 60 ½-bots.
APOLLINARIS, 25/- Case, 50 bots.; 39/- Hpr., 100 ½-bots. Hampers free. 5 °/₀ discount if 20.
HUNYADI JÁNOS (10 Cases, 3/- and 5/- less), 30/- Case, 25 bots.; 50s. Case, 50 ½-bots.

SELTZER ..	11/-	Hpr.,	25 bots.
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PULLNA ..	18/-	Case,	20 bots.
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VICHY ..	31/-	,,	50 bots.
,, ...	27/-	,,	50 ½-bots.
CARLSBAD ..	37/-	,,	50 bots.
KISSENGEN ..	42/6	,,	50 ,,
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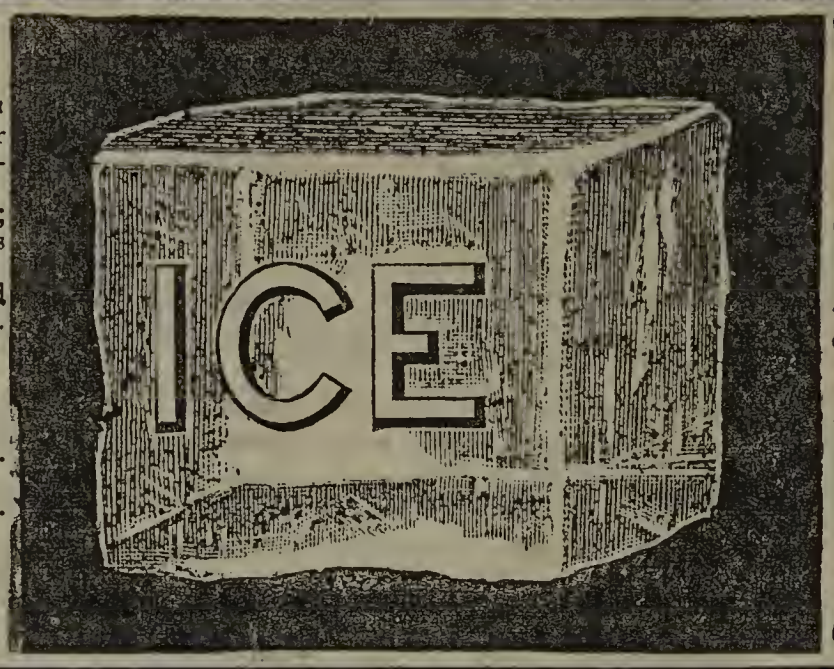
HOMBURG ..	37/6	,,	50 ,,
WILDUNGEN	40/-	,,	50 ,,



CARLSBAD SALTS, ¼-bots., 20/- per doz.; ½-bots., 40/- per doz.; bots., 80/- per doz.

NORWAY
BLOCK ICE.

Original Blocks, 2s. per Cwt.
Packing and Mats free.
Low quotations given for quantities taken from vessels while discharging.
PRINTED DIRECTIONS for STORING ICE sent free on application.

W. B. HARRISON,

IMPORTER of ICE and MINERAL WATERS,
6, Bridge St. Sunderland.

HENRY'S CALCINED MAGNESIA

Continues to be prepared with scrupulous care in the greatest chemical purity, by

MESSRS. THOMAS AND WILLIAM HENRY,

11, East Street, St. Peter's, Manchester.

And sold in bottles, authenticated by a Government Stamp bearing their names.

Price 4s. 6d., or 2s. 9d.

Trade Mark, HENRY'S CALCINED MAGNESIA

NEW YORK—Messrs. J. & S. FERGUSON, Pine Street. *PARIS—Messrs. ROBERTS & CO., 23, Place Vendome.*

THIRTEEN PRIZE MEDALS, FIVE GOLD.

CAUTION.—MARK YOUR LINEN WITH

BOND'S CRYSTAL PALACE GOLD MEDAL MARKING INK.

No heating required.

By Official Appointment to the QUEEN and COURT OF HOLLAND. Certificate of Merit signed H.R.H. PRINCE OF WALES.

Purveyor to the

13 PRIZE MEDALS.
5 GOLD MEDALS.

The First Order of Merit,
SILVER MEDAL,
NEW ZEALAND,
1882.

Army and Navy.

It is false as Reported by interested persons that we do NOT supply less than £100 Orders. Any quantity can be obtained.

To avoid spurious imitations, see that the words "**Daughter of the late JOHN BOND**" appear on the Labels. (*See that you get it*). The Academie Nationale Socicty of Manufactures and Commerce, Paris, have awarded me the Grand Diploma and Premier **GOLD MEDAL** for perfection in Marking Inks. *Extract from the "Academie Journal," April,* 1870: "We have tested fifty Marking Ink Makers' preparations since 1855, and pronounce this the most successful article."
Works: 75, SOUTHGATE RD., LONDON. *Shippers and others please send for Illustrated Price List. Free Carriage on parcels of £5 & upwards.*

THIRTEEN PRIZE MEDALS, FIVE GOLD.

Terms for Advertisements in the PHARMACEUTICAL JOURNAL *may be had on application to the Publishers,*
J. & A. CHURCHILL, 11, NEW BURLINGTON STREET, LONDON, W.

Since the introduction of Pepsine by BOUDAULT and Dr. L. CORVISART, BOUDAULT'S Preparations have been considered the most reliable.

BOUDAULT'S PEPSINE.

The Paris Hospitals have used no other.

PARIS, 1867. *Medaille Unique.*

HAVRE, 1868. *Medaille D'Argent.*

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PARIS, 1878.

The Jury of the International Exhibition, Paris, 1867, awarded to BOUDAULT'S Preparations the *only* Medal given for Pepsine. Since that time it has taken the Medal at each of the International Exhibitions—Havre, Lyons, Vienna, Philadelphia, and Paris, 1878.

BOUDAULT'S PEPSINE—dose, 5 to 10 grains—in bottles, one ounce, 5/-; in bottles, half-an-ounce, 3/-
BOUDAULT'S PEPSINE WINE—dose, a tablespoonful—in bottles, 4/- and 8/-
BOUDAULT'S PEPSINE PILLS AND LOZENGES—dose, 2 to 4—in bottles, 3/3.

HOTTOT BOUDAULT, 7, Avenue Victoria, Paris. SQUIRE, 413, Oxford Street, London.
CAN BE HAD OF ALL CHEMISTS.

Apenta

A POSITIVE CURE FOR STOMACH, LIVER & KIDNEY AFFECTIONS.

The Only Palatable Natural Aperient Water.

THE BEST HOUSEHOLD REMEDY & SPECIFIC FOR CONSTIPATION

Highest Award at the International Medical Exhibition, 1881. Retail 1/6 & 2/- per Bottle.

A SUPPLY OF CIRCULARS WITH NAME AT FOOT AND DESCRIPTIVE PAMPHLETS FREE ON APPLICATION.

Chemists can safely stock this Water, as it will continue to be well advertised.
It is prescribed by all the leading Medical Men.

ÆSCULAP BITTER WATER COMPANY, Limited, 38, Snow Hill, LONDON, E.C.

TURNER'S TARAXACUM OR DANDELION COFFEE

IS THE BEST.

TRADE MARK.

Is sold in 6d., 1s., and 2s. Tins only, and each Tin bears the Proprietor's
"Registered Trade Mark"
on the Wrapper, without which it is not genuine.

TURNER'S DANDELION COFFEE

IS RECOMMENDED BY THE FACULTY. *See Testimonial.*

TESTIMONIAL from C. SPENCER, Esq., M.R.C.S., Whitchurch.
"Dear Sir,—I have tried you Coffee, like it, and can speak very highly of it. "Yours truly,
"*Mr. J. Turner.*" "C. SPENCER."
This Preparation is well got up, gives a good profit, and will only be supplied to one Chemist in each Town.

TRADE MARK.

TERMS ON APPLICATION TO THE PROPRIETOR.

Prepared and Sold by J. TURNER, Pharmaceutist, AYLESBURY.

HEWLETT'S

LIQUOR SANTAL FLAV. C. BUCHU ET CUBEBÂ

PLEASE NOTE AND HAVE OUR ORIGINAL ARTICLE, WHICH MUST BEAR OUR SIGNATURE.

Since we introduced this elegant preparation it has been largely employed in the treatment of gonorrhœa and gleet, and with the happiest results. It is so much superior to copaivi, as it does not interfere with the digestive organs. The disagreeable eructation which follows the administration of copaivi is not experienced, and the unpleasant rash (*Urticaria*) has not been noticed. It is especially indicated in the advanced stages of gonorrhœa and chronic gleet. If it be given in the beginning, before the inflammation has fully developed, it may sometimes succeed in abating the attack, but if it fail to accomplish this it had better be suspended, as it may aggravate the symptoms during the inflammatory stage. In other inflammatory affections of the genito-urinary mucous membrane, such as pyelitis and chronic cystitis, when the disease is of a subacute or chronic character, the liquor santal may be employed with great advantage. Santal Oil has been the remedy of some eminent surgeons in the treatment of gonorrhœa, but in combination with buchu and cubebs it is much more efficacious. The great difficulty in its administration was its suspension in mixtures, but this trouble is arrested by a beautiful pharmaceutical process, and our preparation will be found perfectly miscible in water.

Price (in England) 10s. 6d. per pound, packed in 10 oz., 22 oz., 40 oz., and 90 oz. Bottles.

From Dr. GOURLEY, F.R.C.S., Senior Surgeon, Hartlepools Hospital.

"I have found your 'Liq. Santal Flav. cum Buchu et Cubebâ' invaluable in several cases of gonorrhœa, and more particularly in gleet. I consider it one of our best remedies in this frequently tedious complaint. It forms a nice mixture, and is quite free from the symptoms produced by copaiva.—S. GOURLEY, M.D., F.R.C.S., Senior Surgeon to Hartlepools Hospital.—To Messrs. C. J. HEWLETT & SON, Cree Church Lane, London."

C. J. HEWLETT & SON,

MANUFACTURING AND PHARMACEUTICAL CHEMISTS,

40, 41 & 42, CHARLOTTE STREET, GREAT EASTERN ST., LONDON, E.C.

(Late CREE CHURCH LANE) ESTABLISHED 1832.

N.B.—Export Prices Current forwarded on application, giving most liberal terms.

KILNER BROS., Glass Bottle Manufacturers,

Solicit orders for MEDICAL DISPENSING BOTTLES (Green and White Flint) and other kinds used by Chemists.
Also for their new Feeders. "OUR BABIES' BOTTLE."

(6d. Retail) 36s. 38s. 42s. AND 44s. per Gross.

(1s. Retail) 75s. AND 81s. per Gross.

(1s. 6d. Retail) 108s. AND 120s. per Gross.

Terms and Discounts forwarded on receipt of application stating quantity required. Large buyers liberally treated with. Illustrated Price Lists of all kinds of Bottles on application to KILNER BROTHERS, 10. Great Northern Goods Station, King's Cross, London.

COD LIVER OIL
PETER MÖLLER'S

The London Offices and Warehouse for PETER MÖLLER'S Cod Liver Oil are removed to 43, SNOW HILL, E.C. Chemists willing to use Show Cards, &c., are requested to make direct application. Möller's Cod Liver Oil can be obtained through any Wholesale House or from the London Office.

ROBINSON'S ORANGE WINE

(VIN. AURANTII, B.P.)

Specially prepared for Quinine Wine, does not deposit, will keep good in any Climate, and well adapted for Export Trade. Supplied in Casks containing 9, 18, 30, 60, or 120 Gallons. Terms on application.

THE UNIVERSAL CORN AND WART PENCIL.

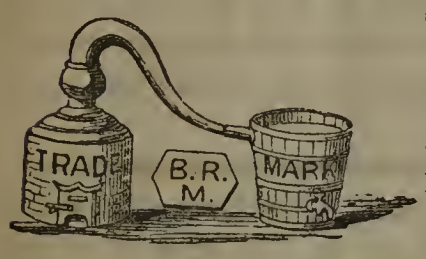
1 doz. mounted on a handsome Illustrated Show-Card, Retail, 6d. each; Wholesale, 3s. 6d. per doz. It is especially adapted for Export Trade, and may be safely sent to the hottest climates, as each glass tube is hermetically sealed and enclosed in a cardboard case.

N.B.—The above is exempt from Stamp Duty by permission of the Board of Inland Revenue.

CONCENTRATED WATERS.—One Ounce of these Waters added to

Forty Ounces of Distilled Water forms a clear Medicated Water (without filtering), similar in every respect to those prepared according to the directions of the British Pharmacopœia, and free from all Chemical impurity. They are prepared to supply a want long felt by Chemists and Medical Men, and by their use a fresh supply of any of the Medicinal Waters may be obtained at a moment's notice. They are not affected by age in any climate. N.B.—Used in the proportion of one part to thirty-two of water they represent the Medicinal Waters of the *United States Pharmacopœia.*

	Per lb.		Per lb.		Per lb.
Aqua Anethi, Concent. ...	4/0	Aqua Cinnam. Ver. Concent.	6/0	Aqua Fœniculi, Concent. ...	4/0	Aqua Pimentæ, Concent....	4/0
,, Anisi ,, ...	4/0	,, Cassiæ ,,	4/0	,, Menth. Pip. ,, ...	4/0	,, Rosæ ,, ...	8/6
,, Camphoræ ,, ...	4/0	,, Flor. Aurant. ,,	8/6	,, ,, Ang. Con. ...	6/0	,, Rosæ Virgin ,, ...	10/6
,, Carui ,, ...	4/0	,, Flor. Sambuci ,,	8/6	,, ,, Virid. ,, ...	4/0		



The above are put up in Bottles of ½ lb. or 1 lb. and upwards, each of which has the Inventor's Protection Label over cork.

Wholesale Agents—Hearon & Co., Maw, Son & Thompson, Lynch & Co., London; Evans, Sons & Co., Liverpool; Woolley, Manchester; Bewley & Draper, Hunt & Co., Dublin; Glasgow Apothecaries' Co., Hatrick & Co., Glasgow; Raimes & Co., Duncan, Flockhart & Co., Edinburgh; Foggitt, Thirsk; Goodall & Co., Leeds; J. Richardson & Co., Leicester; Slinger & Son, York; McKesson & Robbins, New York. Special Terms for large quantities may be had from

B. ROBINSON,

Distiller and Brewer of British Wines, Church St., Pendleton, Manchester.

TOWLE'S CHLORODYNE

The Original Preparation, as approved by the Medical Profession on account of its known composition and uniform strength.

Retail at 13½d., 2s. 9d. & 4s. 6d. Dispensing, 4 ozs., 4s. 6d. & 10 ozs. 11s. stamped.

LIQ. CHLORODYNII,

As originally Introduced by A. P. Towle, and free from stamp duty for dispensing.

4 ozs., 4s.; ½ lb., 5s. 6d.; 1 lb., 10s.

TOWLE'S CHLORODYNE LOZENGES AND JUJUBES,

In 1, 2, and 4 lb. Bottles, at 3s. per lb., and 6d. and 1s. Boxes. Foiled, Lined and neatly got up for the counter, 4s. 6d. and 9s. per dozen.

A. P. TOWLE, Chlorodyne Manufacturer,

75, BACK PICCADILLY, MANCHESTER.

Bills with name on application with instructions for forwarding

"CARNRICK'S"

BEEF PEPTONOIDS

A Concentrated Powdered Extract of Beef, Partially Digested and Combined with an Equal Portion of Gluten.

"CARNRICK'S" BEEF PEPTONOIDS contain *only the nutritive portions* of the beef. It contains *no water* and *no inert matter* of any kind. We combine the dry Extract of Beef with an equal *portion* of Gluten to prevent a tendency to deliquescense, and in order to present the preparation in a powdered and portable form. It is well known that Gluten is the most nutritious substance found in the Vegetable Kingdom, and in nutritive elements is closely allied to Beef.

Four ounces of "CARNRICK'S" BEEF PEPTONOIDS represent as much nutritive and stimulating properties as forty-eight ounces of the best lean Beef.

Four ounces of "CARNRICK'S" BEEF PEPTONOIDS contain more nutritive elements than ten pounds of any Extract made by Liebig's formula, and from four to six times more Albuminoids and Fibrinoids than any Beef Extract ever offered to the Medical Profession.

Our machinery and process for the production of BEEF PEPTONOIDS are perfectly adapted to the *elimination* of all inert portions of the Beef, and the *retention* of all the nutritive constituents.

"CARNRICK'S BEEF PEPTONOIDS" *is much less expensive than any other preparation in the market, as it contains neither water or inert matter.*

The favour our preparation of BEEF PEPTONOIDS received at the hands of Drs. Agnew, Bliss, Hamilton, Reyburn, Woodward, Barnes, &c., the corps of eminent Physicians, who employed the preparation with so much advantage in the treatment of the late President Garfield, proves conclusively its great value, not only as food to be taken by the mouth, but also how important an agent it has been found in feeding by the Rectum.

Please refer to the very able article of Dr. D. W. Bliss, in New York *Medical Record*, July 15th, 1882, in which he so frequently refers to our BEEF PEPTONOIDS having been used to so great an advantage, not only in the case of the late President Garfield, but many others as well.

A reliable and experienced person is employed to select the Beeves before they are slaughtered, and to superintend the killing and dressing. Great care is exercised in this respect, and none except the most healthy and suitable Beeves are employed in making our BEEF PEPTONOIDS.

The use of BEEF PEPTONOIDS is indicated as follows:—

Convalescence from all diseases, Fevers, Pneumonia, Weak Digestion, Diarrhœa, Dysentery, Phthisis, Cholera Infantum, Marasmus, Sea Sickness, Excessive use of Alcoholic Stimulants, Per Rectum in all cases where the stomach cannot digest the food, and in debility resulting from any cause. Also a valuable adjunct in voyages and camp life.

The Maltine Manufacturing Co. Limited,

24 and 25, HART ST. BLOOMSBURY, LONDON, W.C.

"THE MONTH."

At the instance of the United States Board of Health a comprehensive investigation has been carried out under the superintendence of Professor J. W. Mallet, with respect to the chief processes in use in the chemical analysis of drinking water, for the purpose of testing the absolute and relative accuracy of the results they are capable of yielding and as far as possible the nature and scope of the practical conclusions that can be drawn from them for sanitary purposes. From a preliminary report (*Nature*, Dec. 28, p. 211, and Jan. 4, p. 231) it appears that nine classes of waters were distributed amongst various chemists to be examined chemically, some using the combustion process, others the albumenoid-ammonia process and others the permanganate process. Class I. consisted of natural waters believed to be wholesome; Class II. of natural waters believed to have caused disease; Class III. of suspected waters; and the remaining six classes of waters intentionally contaminated in various ways. Biological experiments were also made with several of the waters. The report deals first with the degree of accuracy of the three processes, as shown by the amount of concordance in the results obtained by any process in repeated experiments on the same water, and in this respect, on the whole, the most concordant results were yielded by the permanganate process, and the least concordant by the combustion process, the albumenoid-ammonia process holding an intermediate position. As to the agreement of the results obtained with the quantities of organic constituents known to be present in a water, those obtained by the permanganate process were found to be much the least influenced by varying dilution, the combustion process indicating less organic carbon and more organic nitrogen when a weak solution was used, whilst with the albumenoid-ammonia process the weaker the solution the higher were the results obtained both for free and albumenoid ammonia. After stating some special conclusions as to each of the three processes, which can only be mentioned here, the Report passes to the chemical and biological results obtained as contrasted with the actual sanitary history of the natural waters examined. From an inspection of the tabulated results it appears that "no strongly marked generic difference is presented by the results from any of the processes for the estimation of organic matter or its elements between the generally wholesome waters of Class I. and the waters of Class II., which had been medically condemned, and were fairly assumed to be pernicious." It is pointed out, as telling against any chemical theory of the production of disease from this source, that if the whole of the organic carbon and nitrogen present in water of a highly dangerous water existed as strychnine, it would be necessary to drink half a gallon of the water to ingest an average medicinal dose of the alkaloid. But indirectly a larger amount of organic matter may be more dangerous, as furnishing more facilities for the multiplication of organisms. A more conspicuous difference between the waters of Class I. and Class II. was presented by the nitrates and nitrites, which whilst always present and often in large quantity in pernicious waters were either absent or only present in trifling quantity in the wholesome waters. It is suggested "whether the noxious character of water containing much nitrates and nitrites, themselves presumed to be harmless, and little organic matter which ought to be present in some form to support the 'previous contamination' view, may not be in reality due to the presence of a special nitrifying ferment, itself to be classed among the lower organisms capable of propagating disease." The biological experiments did not give satisfactory results, several of the waters believed to be wholesome, and which are largely used, being marked "suspicious," whilst not one of those believed to be pernicious was condemned. Professor Mallet concludes that it is not possible to decide as to the sanitary quality of a water by the mere use of a process for the estimation of organic matter or its constituents, and that there is no sound ground on which to establish such "standards of purity" as have been proposed, fixing the exact amounts of organic carbon or nitrogen, albumenoid ammonia, or oxygen of permanganate consumed, that shall be permissible

Sir William Thompson has delivered an extremely interesting discourse before the Glasgow Philosophical Society on "Approximative Photometric Measurements of Sun, Moon, Cloudy Sky, and Electric and other Artificial Lights." The lecturer pointed out that we have six senses, not five as is commonly made out, viz.:—Sense of force, sense of heat, sense of sound, sense of light, taste, and smell, a definition which was first given by Dr. Thomas Reid. Sir William shows from Pouillet's experiments on the radiant energy of the sun that the solar surface gives out radiant energy at the rate of 50 horse-power per square inch. A Swan incandescent lamp, when incandesced at 20 candles, is calculated to give out three-fourths of a horse-power per square inch. Hence the activity of the sun's radiation is about sixty-seven times greater than that of a Swan lamp per equal area, when incandesced to 240 candles per horse-power (*i.e.*, one Swan lamp at 20 candles requires one-twelfth of a horse-power). In remarking on the Carcel lamp and the standard candle, as photometric standards, the opinion was expressed that if as many precautions had been taken in elaborating the standard candle as have been taken in the use of the Carcel lamp, the standard candle would be as reliable as the lamp. Sir William further mentioned the interesting suggestion made by Violle of the use of molten platinum as a light standard. From Violle's experiments, communicated to the Paris Conference on Electrical Units by M. Dumas, Sir William considers that the tint of Violle's glowing platinum cannot be very different from that of the ordinary Swan lamp incandesced to its "twenty candles," and further that both as to tint and brightness it would appear that melted platinum at its "freezing" temperature is nearly the same as a carbon filament in vacuum incandesced to 240 candles per horse-power. For approximative photometric measurements, the author states that the "shadow method" of Rumford, when used with a reasonable amount of care, will give results within 2 or 3 per cent. of accuracy. The conclusions arrived at by the learned physicist as regards the luminous intensity of the moon's surface are very interesting reading. From his own experiments he concludes that the moon radiates something not enormously different from one-quarter of the light incident upon it. If about, say, one candle to every five square centimetres of surface was present on the moon, and the candles were all burning normally, the light received at the earth would be about the same in quantity, as estimated by our eyes, as it really is.

It would have very much the same tint and general appearance as an ordinary theatrical moon, except that it would be brightest at the rim and continually less bright from the rim to the centre of the circle, where the brightness would be least. The luminous intensity of a cloudy sky, about 10 a.m. one day, in York, during the meeting of the British Association, he found to be such that light from it through an aperture of one square inch area was equal to about one candle. An experiment on sunlight, made at one p.m. on December 8, at his house in the University, showed that the sun's surface as seen through the atmosphere at the time and place of observation was twenty-four times as bright as the Swan carbon when incandesced to 240 candles per horse-power. From the conditions of the experiment it followed that the intensity of the light from the sun's disc was equal to about 53,000 candles. This is more than three times the value found by Arago. "So much for a Glasgow December sun." Sir William considers that it cannot be very far wrong to estimate the light of the full moon anywhere on the earth as about one seventy-thousandth of the sunlight. A very full abstract of the lecture will be found in *Nature* of the 18th inst.

The now familiar cry of gas *versus* electricity has been the subject of a series of letters in the *Times* during the present month. The letters originated with a correspondent who, signing himself "Lux Pura," imagined he had detected large quantities of sulphuretted hydrogen in the gas supplied by the London companies, and gave a popular way of applying acetate of lead paper as a test for the presence of this noxious compound. The letter was full of crudities and a remarkable illustration of the proverb that "a little knowledge is a dangerous thing." Very able rejoinders have been made by Mr. H. Leicester Greville, of the Commercial Gas Company, and by Mr. G. Livesey, the well-known gas engineer, setting forth the true state of the law by which gas companies are bound to supply gas practically absolutely free from sulphuretted hydrogen.

At a recent meeting of the Newcastle-upon-Tyne Chemical Society an adaptation of the electric light for the illumination of microscopic objects, contrived by Mr. C. H. Stearns, was exhibited. It consists in the use of a Swan's incandescent lamp, which is calculated to give from one to three candle power, and is readily controlled by means of a small resistance coil of iron wire interposed in the circuit. Two or three Grove or Bunsen cells suffice as a source of electricity, or where the fumes would be objectionable a Leclanché battery may be employed, or better still an accumulator. The lamp may be readily fixed in any required position by means of a clamp; but in Mr. Stearns's microscope three lamps are permanently attached to and made a portion of the instrument, the body of the microscope forming one connection. One lamp is fitted above the stage; one below it, on the sub-stage; and one below the sub-stage, for polariscope work. Each lamp is connected with a three-way switch, so that the position of the light can be freely altered. At a recent meeting of the Obstetrical Society of London, also, Dr. Aveling exhibited a modification of Swan's incandescent lamp, so made that it could be introduced into cavities of the body for operative purposes.

According to the *Athenæum* of the 20th inst., Messrs. Mawson and Swan, of Newcastle-on-Tyne, have constructed a small accumulator, weighing five pounds, which is capable of supplying electricity for working one Swan lamp continually for two hours, and for a much longer time if the electricity is turned off when not required. This arrangement with Swan's lamp has been adopted with great advantage for the taking of microphotographs.

Mr. Octavius E. Coope has contributed a very valuable summary of his experience in electric incandescent and gas lighting at his mansion Berechurch Hall, three miles from Colchester. He adopted the Swan incandescent lamp and the Burgin machine, and the result of his experience is in every way decidedly in favour of electric lighting. One sentence from his letter is well worth reproducing here:—"The whole has been carried out as specified, and the result has been a success that has exceeded my expectations. The light is quite as easy to manage as gas, while the softness, the purity, and the agreeableness are such that a return to any other method of illumination would be now quite out of the question. The pictures, books, and decorations have no chance of injury; the ceilings and walls remain unsoiled, while the difference in health felt after sitting in a room electrically illuminated and another lighted by gas must be experienced before it can be appreciated." Very full details are given of the relative cost and maintenance of gas and electric light plant. This letter must be pronounced a most interesting and impartial statement of the question in this particular instance.

Electrical amateurs desirous of constructing a powerful plate electrical machine, at the moderate cost of a few shillings, should read the description of the Wimshurst "influence machine," given in the *English Mechanic* of the 12th inst.

According to a communication forwarded to Mr. Weldon by Messrs. Chance Brothers, the plant for treating about three hundred tons of vat waste per week by the Schaffner and Helbig sulphur recovery process, which consists in decomposing calcium sulphide with magnesium chloride (*Pharm. Journ.* [3], xii., 969), is nearly completed in their alkali works near Birmingham. Part of the plant is already at work, and it is said that the problem of the generation, storage and economical combustion of sulphuretted hydrogen thus derived from vat waste, and the construction of suitable apparatus for the purpose, may now be considered solved. At Messrs. Chance's works the sulphuretted hydrogen is stored in a gas-holder of 30,000 feet capacity, the outer water ring of which, in order to prevent any smell through an escape, is covered with a layer of dense mineral oil. At present the sulphuretted hydrogen passes from this gas-holder to a kiln, where it is burnt, the heat evolved being more than sufficient for a Glover's tower, through which the burnt gas, containing sulphurous oxide, is passed, and the conversion into sulphuric acid is uniformly effected with a very low consumption of nitre. In this way it is found practicable to recover from 90 to 95 per cent. of the sulphur from alkali waste as pure vitriol. The carbonic acid gas required for the decomposition of the calcium chloride bye-product, and for making its chlorine available for the reconversion of the magnesium oxide into magnesium chloride, is derived from a lime kiln, but probably it will also be possible to utilize flue gases.

In a communication to the Academy of Sciences (*Comptes Rendus*, xcv., 1363), M. Planchaud has contributed some further observations upon the condi-

tions under which the reduction of sulphates is effected by "sulphuraria" and analogous algæ. He states that the introduction of 2 grams of chloroform into a flask containing these algæ, which had yielded sulphurous water weekly for a period of three months, stopped the action of the algæ for a month, after which, upon the evaporation of the chloroform, they resumed their activity. One gram of carbolic acid produced a similar result, but six grams stopped the action altogether by the killing the algæ. Another experiment consisted in enclosing some of the algæ between cakes of gypsum, the edges of which were luted. Upon separating the cakes some considerable time afterwards a few minute yellow points of crystallized sulphur were visible to the naked eye, due to the reducing action of the algæ, and M. Planchaud considers that this furnishes an explanation of the formation of the sulphur deposits which have been met with under the subsoil of Paris. He also considers that most of the natural deposits of metallic sulphides are attributable to the same origin.

Messrs. Gayon and Dupetit are continuing their investigation of the transformation of nitrates into nitrites under the influence of micro-organisms. They now describe (*Comptes Rendus*, xcv., 1365) four kinds of microbes, two requiring atmospheric oxygen for their development and two not, which are capable of removing two-thirds of the oxygen from alkaline nitrates. The most active of these, when sown in minute quantity in chicken broth containing 10 grams of potassium nitrate to the litre, multiplies rapidly at a temperature of 35° C. The liquid becomes turbid, but there is no evolution of gas, and under favourable conditions this kind of microbe has been found capable of reducing 9·6 grams of nitrate per litre per day. During the reduction some carbonic acid is formed, which is retained in the liquor in the form of potassium carbonate; but this does not represent all the oxygen derived from the decomposition of the nitrate. The least active of the four kinds decomposed 2·8 grams of nitrate per litre per day. Other organisms have been found to exercise this reducing action, and among them the microbe of chicken cholera, the splenic fever bacterium and the septic vibrion, but only to a comparatively limited extent.

M. Gayard describes (*Répertoire*, xi., 16) a method for the preparation of oxygen at the ordinary temperature by mixing potassium permanganate with strong nitric acid. Some nitrate of potash is formed, permanganic acid being set free and reduced. From this point oxygen is evolved with great regularity until two and half equivalents of the permanganic acid have been liberated, when the evolution stops suddenly. But if the vessel containing the mixture be plunged into boiling water, the oxygen from another half equivalent of acid can be obtained.

In a note on the use of asbestos filters for filtering liquids in chemical analysis (*Am. Journ. Pharm.* [4], xiii., 37), Mr. Cassamajor expresess a preference for the Australian kind, because the fibres being less flexible than in the Canadian or Italian they do not felt together and pack so closely on the perforated plate, and therefore allow the liquids to filter more rapidly. He recommends that the asbestos should be prepared for use by first rubbing it upon a coarse sieve (10 meshes to the inch), freeing what passes through from dirt by stirring it with water upon another smaller sieve (25 to the inch) until the water passes through clear, boiling the washed asbestos with strong hydrochloric acid for about half an hour, washing the pulp with distilled water on a perforated platinum plate placed in a funnel until quite free from acid, and then heating it strongly in a platinum dish. After cooling the asbestos should be preserved in a wide-mouthed stoppered bottle.

According to M. Féréol (*Practitioner*, Jan., p. 53), ammoniacal sulphate of copper is of great value in tic-douloureux and neuralgia of trigeminal origin. In almost all cases in which it was tried, it relieved the pain, sometimes instantaneously, and restored sleep to the patient after having been deprived of it for weeks. The usual dose was from 10 to 15 centigrammes, according to the susceptibility of the patient.

Drs. Ringer and Murrell have recently published a communication (*Lancet*, Jan. 6, p. 7) on the use of permanganate of potash in amenorrhœa. This salt is given in doses of one or two grains, beginning with one grain three times a day, increased to two grains four times a day, the desired result being usually obtained in three or four days after administration. It is said to succeed well after the failure of other remedies, such as iron, aloes, nux vomica, strychnia, pulsatilla, nitroglycerine and hot mustard baths. The fact that manganate of soda and binoxide of manganese were found to be "equally efficacious" would appear to indicate that the action is due to the manganese and not to the salt, in which case the use of the permanganate might be only a roundabout way of administration, especially when the necessary speedy reduction of this salt in the stomach is taken into account.

More than one writer to the *Lancet* (January 13, p. 86) calls attention to the fact that permanganate of potash forms a valuable injection for gonorrhœa, generally arresting the discharge in a fortnight. The strength recommended is half a grain to the ounce of distilled water.

In August last, M. Wecker directed attention to the fact that the seeds of the jéquirity plant, *Abrus precatorius*, used in the form of a lotion, were capable of producing artificially a purulent inflammation of the conjunctiva, which could be advantageously used in ocular therapeutics. The cause of this inflammation has been investigated by M. Silva Aranjo (*Comptes Rendus*, xcvi., p. 1204), who has submitted to microscopical examination the infusion and maceration of the seed and the exudation produced by their use. He finds that both preparations of the seed contain a great number of gonidia, which develop abundantly on the conjunctiva, and are probably the cause of the purulent condition which follows the use of the drug.

Dr. M. Carter (*Brit. Med. Journ.*, January 6, p. 9) calls attention to the successful treatment of tetanus with *Gelsemium sempervirens*. Although the suggestion of the probable utility of this remedy in such cases was made so long ago as 1875, the confirmatory evidence recently adduced shows the value of the investigation of the physiological action of drugs.

A correspondent of the *British Medical Journal* (Jan. 13, p. 90) states that he has found the application of a strong solution of chromic acid, three or four times, by means of a camel's-hair pencil, to be the most efficient and easy method of removing warts. The warts become black and ultimately fall off.

The operation of sponge-grafting seems to be coming into favour with surgeons. It is quite possible that

the day is not far distant when sponge prepared for this purpose will be required at the hands of pharmacists. In the *British Medical Journal* (January 13, p. 51), Dr. P. W. Perkins Case describes its preparation as follows :—"Our method is to get the finest Turkey sponge free from grit, etc., and slice it as thin as possible, soak it in acid. nitro-hydrochloric. dil. for two or three weeks, till all the calcareous and silicious matters are dissolved, when after repeated washings with water, it has a very soft velvety feel; this, neutralized by washing with liquor ammoniæ and steeping in carbolic acid solution (1 to 20) for twenty-four hours, is ready for use."

Dr. J. Whitson, in "Notes on the Treatment of Ulcers" (*Practitioner*, Jan., p. 20), remarks that the application of a specially prepared sand to granulating sores has been tried for some time with success, and that it possesses the advantage, since it absorbs the discharge, of seldom requiring removal, so that healing can proceed without interruption. This sand is prepared as follows :—It is first heated to a temperature capable of destroying all organic particles. It is then soaked in a solution of 1 part of bichloride of mercury in 1000 parts of water. After this the mixture is placed in bottles and can be used when required. This mode of treating ulcers is not new, the sandy earth of the termite ants having long been used for this purpose by the natives of the West Coast of Africa. This substance was some time since imported by Mr. Thos. Christy, under the name of "termite earth," for trial in this country, but whether it possesses any antiseptic properties derived from the white ants is not known.

In the *Practitioner* (January, p. 17), Dr. Ringer states that an antagonism exists between veratrine and potassium salts as regards their physiological action. He was led to experiment in this direction by observing the fact that a saline solution containing lime caused the ventricle of the heart to dilate very slowly after each contraction, an effect produced also by veratrine, and that the presence of a small quantity of a potassium salt prevented this result. He finds that a small dose of potassium chloride will completely obviate this effect of veratria and restore normal contraction. If this view of the antagonistic action of calcium and potassium salts be confirmed, it will throw some light on the effects produced by certain mineral waters, and indicate the importance of a knowledge of the physiological action of even the commonest articles of food and medicine.

According to a recent communication to the Academy of Sciences from M. Bert (*Comptes Rendus*, xcv., 1253), inoculation with the slaver from the mouth of a mad dog, after filtration through plaster, does not reproduce the disease, but if the substance retained on the plaster be used hydrophobia is the result. He has also found that if the secretions which together form the slaver be separated they differ in their action. Thus inoculation with mucus from the respiratory passages of a mad dog will reproduce the disease; but if the secretion of the salivary glands alone be used it is inert in this respect, although it may cause death by setting up local suppuration. The saliva of a mad dog still possesses the property of converting starch into sugar.

M. Sanson has placed on record (*Comptes Rendus*, xcvi., p. 75) some experiments made upon the substance "avenine," isolated by him from oats, with a view to determine its effect upon the neuro-muscular excitability of horses. Avenine is a brown uncrystallizable substance found in the pericarp of the fruit and has the formula $C_{56}H_{24}NO_{18}$. The amount present in different varieties of oats is not uniform; the white sorts contain less than the dark, and the place of cultivation also influences the proportion present. Crushing the grain weakens the excitant property, so that whole grain is the most valuable for feeding purposes when work is required from the animals. Oats containing less than 0·9 per cent. of avenine cannot be relied on to give rise to the neuro-muscular excitability, which is produced with certainty when that proportion is exceeded. If the same effect is produced on human beings, the value of oatmeal porridge as a nutritious food where physical work is required is obviously not exaggerated. The wonderful properties as a nerve stimulant, attributed by Dr. Sell to oats, in the *New York Medical Gazette*, may be due to this active principle.

Lippia Mexicana, a Verbenaceous plant which has been recently recommended as a remedy in asthma and the cough of phthisis, has been submitted to a chemical examination by Dr. Podwissotzki, of Dorpat, who reports (*Ph. Zeit. f. Russl.*, xxi. 925) that he has separated from it a tannin, a crystallizable colouring substance belonging to the quercetin group of no medicinal importance, an oxygenated essential oil and a camphor. This camphor, which has been named "lippiol" and appears to be the principal representative of the medicinal activity of the plant, occurs in small quantity in the leaves, and as it readily volatilizes, it may be easily lost in transport or keeping. It melts between 25° and 30° C., and in composition corresponds to menthol. In the presence of the essential oil ("lippienol"), which occurs in larger quantity, the camphor mixes with water, forming a white emulsion-like mixture, having a bitterish taste. Dr. Podwissotzki considers his results indicate that the best pharmaceutical preparation would be a tincture of the fresh plant, prepared with alcohol strong enough to dissolve both the camphor and the oil, in the proportion of one part by weight of the flowers and leaves to nine of alcohol.

In a paper read before the Pennsylvania Pharmaceutical Association Meeting (*Pharmacist and Chemist*, January, p. 23), Mr. C. C. Klump gave the result of some experiments made upon the podophyllin resin of commerce with the view of ascertaining if the portion soluble in ether represents the active ingredient of the resin. He found that the portion of the resin insoluble in ether did not produce purgative effects, even when taken in the dose of 2 grains; while $\frac{1}{4}$ of a grain of that soluble in ether proved purgative. One specimen examined by him contained 20 per cent. of resin insoluble in ether, and a specimen precipitated by alum yielded above 20 per cent.; while another, prepared according to the process of the U.S. Pharmacopœia, gave only ·6 per cent. The use of alum thus increases the product by 20 per cent. of insoluble resin above the amount of soluble resin yielded by the official process.

A new kind of vanilla has been described by M. Charbonnier (*Répertoire de Pharmacie*, Jan., p. 19. It is called in commerce Guadeloupe vanilla, and is the product of a plantation which was made in that island seven or eight years ago. The pods are compressed, not irregularly triangular like the Mexican, but approaching in aspect those of Bourbon and Java, from which it differs in having a darker colour. It is drier and does not so readily become

covered with crystals of vanillin; the surface is striated longitudinally and has very few depressions. The perfume is peculiar and not so fine or so persistent as that of Bourbon vanilla, for which reason it is sold at about half the price. M. Charbonnier doubtfully suggests that it may be produced by a variety of *Vanilla planifolia*.

At this season of the year there are comparatively few medicinal plants in blossom. The coltsfoot (*Tussilago farfara*) has begun to open blossoms here and there; in warm sheltered districts in the South of England, *Daphne Laureola* may be found in flower, and *D. Mezereum* in flower is reported from the Isle of Wight.

In the Cambridge Botanical Gardens a fine shrub of *Hamamelis virginica* was, towards the beginning of the month, covered with its pale yellow starry blossoms; and in the conservatory a gigantic plant of *Aloe plicatilis*, said to be the largest in Great Britain, presented numerous opening spikes of flowers.

The return of coloured sepals to their original green hue is always a matter of interest, inasmuch as the circumstances which lead to the change are worthy of observation. This is more particularly the case when the flower has an abnormal structure like the Christmas rose, *Helleborus niger*, in which the petals are themselves green, and in which from the early period of flowering it is hardly probable that the flowers have been cross-fertilized with species having green sepals, such as *H. viridis* and *H. fœtidus*. Mr. Woolley Dod, writing in the *Gardeners' Chronicle* (January 6, p. 16), believes that the cause of the change is under, rather than above, the soil. From the fact that the same plant one year produces white and another year green flowers, and that the late flowers are more apt to be green than the early ones, it would seem as if a loss of vitality or want of nutrition were the cause. It is possible, however, that the sepals, being persistent, ultimately turn green, as asserted by some (*ibid*, Jan. 13, p. 57), owing to different chemical changes taking place after fertilization, and that when these take place at an early period the white colour more quickly gives place to the green. At all events the matter seems worthy of investigation from this point of view.

The *Gardeners' Chronicle* has lately given several papers from the pen of Dr. Plowright on heterœcismal fungi, a word applied to those leaf parasites which in one stage of their life history live on one plant, and at another stage derive their nourishment from a plant of a totally different natural order. As some of the host plants are used in medicine it may interest some of our readers to observe the fungi for themselves. *Rœstelia cancellata*, appears on the savine, as *Podisoma sabinæ*; and *R. lacerata*, which may be seen on the stems of the juniper in the form of yellow gelatinous linear projections, produces the *Rœstelia lacerata*, found on the leaves of the hawthorn. Two fungi found on wheat, *Uredo linearis* and *Puccinia graminis* exist in another stage on the berberry as *Œcidium Berberidis*; while the rust on oats, *Puccinia coronata*, occurs under another form on the buckthorn as *Œcidium Rhamni*.

It is generally supposed that the sunflower turns its face to the sun, but it is not so generally known that it rapidly returns to its original position soon after sunset. Mr. C. A. White, of Washington, remarks (*Nature*, January 11, p. 261), with regard to the wild variety of *Helianthus annuus*, L. (*H. lenticularis*, Douglas), that the flowers, which had taken the whole day to follow the sun from east to west, in one hour after sunset had already turned their faces to the east.

At a meeting of the Linnean Society on December 21, Mr. T. Cary read a paper on the development and mode of fertilization of *Asclepias Cornuti*. He pointed out that the petals and stamens, which are ultimately adnate, in the early stage originate separately, and that the broad filaments of the stamens form a fleshy pentagonal ring so as to be monadelphous. The stigmatic disc is not formed by the fusion of two stigmas, for the styles proper remain distinct through their entire extent. The pollen appears to exhibit an isolated and peculiar case of formation, approaching in one feature to that of *Naias* and *Zostera*.

Dr. Emerson Reynolds has recently recorded some interesting experiments made with a view to show how differently substances having the same elementary composition may act upon plants. He took sulphocyanate of ammonium and sulphurea, each of which contains two equivalents of nitrogen, four of hydrogen, one of carbon and one of sulphur, and found that the former acts as a poison to plants, while the latter stimulates the growth of the same kind of plants under like conditions and induces healthy development. This result evidently depends on the fact that the molecules of which the two bodies are composed are differently grouped.

M. Mangon has given (*Comptes Rendus*, xcvi., p. 80) the results of his investigation of the leaves of the ice plant, *Mesembryanthemum crystallinum*. The transparent vesicles, which cover the leaves like frozen dew-drops, contain a weak solution of common salt. The whole plant consists of a similar solution of alkaline salts retained in a state of solidity by vegetable tissue the weight of which does not exceed 2 per cent. of the entire mass. The ash, formed of salts of sodium and potassium, constitutes 43 per cent. of the weight of the dried plant. M. Mangon suggests that the capability of the plant to take up alkaline salts might be utilized in the removal of the excess which renders unproductive certain portions of the Mediterranean coast.

Mr. Becker (*Nature*, January 4, p. 231) has lately solved a riddle that has long puzzled travellers. In the white sand of the Ergent mountains, at Sarepta, (Asiatic Russia), curious stones are found which, when broken open, exhibit a brown kernel with a white spot in its centre. Some of these are of the size and shape of a hazel nut or walnut, others are cylindrical. Their surface is rough, and resembles a collection of drops, heaped upon and beside one another. Humboldt believed that they were recent formations. Zwick regarded them as very old. The formation of these stones is ascribed by Becker to the exudation of milky juice from roots of plants. *Euphorbia gerardiana*, *Tragopogon ruthenicus*, and *Scorzonera ensifolia* grow plentifully in the white chalky sand, and their long roots being inhabited and seamed by insects, the milky juice continually flows out and cements the soil around the roots. As the root gradually dies and disappears there remains in its place a white, often hollow, kernel, together with the brown colour derived from the root bark, the cylindrical stones being thus formed. The flat and target-shaped stones may originate from the milky juice running into the sand, since hardly any of them exhibited brown kernels.

According to an editorial notice in the *Journal of Botany*, it would appear that it is carried on at a monetary loss to the editor. This is somewhat of a reproach to the botanists of Great Britain, who it may be hoped will not allow one of the most valuable of botanical publications in the country to die out for lack of subscribers. The tendency in the present day for every natural history society to publish transactions of its own probably leads to the neglect of a journal which should receive notices of discoveries from every part of the country, seeing that it is intended to represent the progress of botany in Great Britain. The editor intends continuing the journal for another year at his own risk, and it is to be hoped the experiment may be a successful one, so that in the coming year he may not merely be able to cover his expenses, but find that the journal brings in a proper remuneration for the time and labour expended in editing it. The interesting "short notes" might form a very valuable feature in the journal if botanists in all branches of botanical science would record their observations, many of which too often are never allowed to see the light. The journal would then become more largely a British Journal of Botany.

At the drug sales this week *Cassia moschata* pods were offered. The false buchu leaves (*Empleurum serrulatum* and *Adenandra fragrans*) which have been put up for sale twice previously have not as yet met with a buyer. Morea galls and oval, smooth, not tuberculated Chinese galls were, among other rare drugs, exposed for sale. A singular kind of scammony, of soft, almost doughy consistence, was also noticed.

LIME JUICE: ITS PROPERTIES AND USES.*

BY MICHAEL CONROY, F.C.S.

Lime juice is the expressed juice of the fruit of *Citrus limetta*, a member of the orange tribe (Aurantiaceæ). The tree is a thorny bushy evergreen, with handsome dark foliage of exquisite fragrance. The flowers are white, resembling orange blossoms, and their perfume is equally delicious. The tree flourishes best in a light sandy soil near the sea, and comes into full bearing in about seven years after the seed is set. It grows wild in nearly all tropical countries, but is now largely cultivated in the island of Montserrat. The fruit is about one-half the size of the lemon, with a smoother and thinner rind, oval, rounded at the extremities, and of a pale yellow or greenish-yellow colour. The exterior of the rind possesses a fragrant odour, and a warm aromatic, slightly bitter taste, somewhat similar to that of the lemon. The juice, when fresh and sound, is sharply acid, with a peculiar refreshing and grateful flavour. In Montserrat the lime fruit harvest is heaviest from September to January, but a good supply of fruit is yielded throughout the whole year. Here, where the lime tree is specially cultivated for the sake of the juice, the work is done in a systematic manner with suitable machinery. The fruit, after collection, is taken to two central factories, where it is sliced by water power, and then squeezed in huge wooden presses, the juice being run into puncheons and quickly bunged up. This is a most important point in preparing the juice in a tropical climate, for if left exposed it would rapidly decompose. I am also informed that the choice fruit is alone used, and that only about two-thirds of the juice is pressed out, thus ensuring greater freedom from mucilaginous and pulpy matter. The further pressings, together with the juice of the unsound fruit, is evaporated to the consistence of treacle, and sent over to this country for the manufacture of citric acid.

It is chiefly owing to these precautions that Montserrat lime juice is so much superior to that produced in Jamaica and elsewhere, where no care or supervision is exercised in its preparation.

Lime juice contains citric acid, gum, sugar, albumen, extractive matter, inorganic salts and water. The most important constituent is the citric acid, but as to the percentage of citric acid contained in juice authorities disagree considerably. Upon this point, however, I am in a position to speak with great confidence, as during the last few years I have estimated the citricity of over 4000 samples of Montserrat juice, each sample representing a puncheon of over 100 gallons, and having been taken from the puncheon on the quay after landing. The citricity was estimated by the volumetric process with solution of caustic soda, made of such strength that 1000 grain measures represented 100 grains of citric acid.

By the kind permission of the sole consignees, Messrs. Evans, Sons and Co., Liverpool, I am enabled to place before you in a condensed form, the results of 4160 separate determinations obtained from the puncheons on the quay as above described.

The first table gives the average of each of twenty shipments, obtained by testing each sample separately, adding the whole together and dividing by the number of samples. The other two tables show twenty samples of high citricity and twenty samples of low citricity selected from the whole.

Table No. 1.

Number of samples examined.	Average percentage, free citric acid.	Average per gallon free citric acid, in ounces.
182	8·43	13·48
187	8·14	13·02
415	7·86	12·57
104	8·13	13·00
358	8·40	13·44
368	7·67	12·27
237	7·70	12·32
271	7·55	12·08
62	7·55	12·08
98	7·68	12·28
71	7·57	12·11
302	7·73	12·36
44	7·78	12·44
202	7·82	12·51
228	7·80	12·48
366	7·80	12·48
190	7·89	12·62
167	7·54	12·06
268	7·93	12·68
40	7·84	12·54
Total number samples 4160	Average of whole per cent. 7·84	Average of whole per gal. 12·54

Table No. 2. *High Citricity.*

Free citric acid. Per cent.	Free citric acid. Ounces per gallon.
10·05	16·08
10·05	16·08
10·05	16·08
10·00	16·00

* Read at a meeting of the Liverpool Chemists' Association.

Free citric acid. Per cent.	Free citric acid. Ounces per gallon.
9·95	15·92
9·65	15·44
9·60	15·36
9·60	15·36
9·60	15·36
9·60	15·36
9·55	15·28
9·50	15·20
9·50	15·20
9·50	15·20
9·50	15·20
9·55	15·28
9·45	15·12
9·45	15·12
9·45	15·12
9·45	15·12

Table No. 3. Low Citricity.

Free citric acid. Per cent.	Free citric acid. Ounces per gallon.
6·70	10 72
6·90	11·04
7·10	11·36
6·95	11·12
7·10	11·36
7·05	11·28
7·15	11·44
7·20	11·52
6·85	10·96
7·05	11·28
7·00	11·20
7·10	11·36
6·80	10·88
6·90	11·04
7·00	11·20
6·80	10·88
7·05	11·28
6·95	11·12
7·05	11·28
6·95	11·12

By adding up the first table and dividing by 20 (the number of the shipments) we get 7·84 per cent. as the average citricity of 4160 puncheons, equal to about 450,000 gallons.

Lime juice contains only a mere trace of sugar, while the quantity of gum and albumen is much less than that contained in lemon juice, on which account it is much less liable to fermentation and decomposition than the latter. The quantity of inorganic salts contained in lime juice is about the same and is also of the same nature as is obtained from lemon juice. The ash obtained from ten samples gave an average of 0·43 per cent. of the juice.

During the last decade lime juice has become a most popular temperance beverage, chiefly in the form of cordial, but its chief use is that of an anti-scorbutic on board ship, and while on this point I wish to draw your attention to the following extract taken from an excellent editorial, which appeared in the *Pharmaceutical Journal*, of June 3, 1871, and which contains two most important questions, that I trust will be answered in this paper. After treating of the prevalence of scurvy previous to the passing of the Merchant Shipping Act of 1867, the article says:—

"There can be no reasonable doubt that this system has succeeded remarkably well, as it has secured a proper supply of good juice to the mercantile marine, and scurvy has in consequence diminished from 60 to 70 per cent. But there are two unsettled and very important questions in connection with this subject which pharmacists should be specially able to aid in deciding. (1) The exact analytical standard of lime and lemon juice. (2) Does genuine lime and lemon juice require the addition of alcohol for its proper conservation?"

The first, so far as lime juice is concerned, I think is answered by the tables above quoted, and with the second we shall now deal. Some eighteen months ago, I mixed together over one hundred pint samples of lime juice, representing an entire consignment from Montserrat, and divided the bulk into two equal parts. One part was filtered perfectly bright and bottled off into wine bottles, while the other half was simply strained through muslin before bottling, no preservative whatever being added to either. The samples, on the date they were bottled, were tested for citricity and gave 8·15 per cent. free citric acid. They were then put away in a spare corner of the laboratory, exposed to light and occasionally to the direct rays of the sun for six months, when they were again examined (one from each group) with the following result:—

Filtered sample, 7·95 per cent. free citric acid.
Unfiltered sample, 8·15 per cent. „

At the end of twelve months from the date of bottling, another sample from each group was examined and was found to test exactly the same citricity as when last tried, namely 7·95 and 8·15 per cent. respectively. From this it will be seen that while the unfiltered sample retained its full citricity for twelve months, the filtered sample lost only 0·2 per cent.

This experiment, though put in hand for a different purpose, of which I will presently speak, answers the question as to whether alcohol is necessary for the preservation of lime juice, and when I state that in addition to the above test the juice was as sweet and sound as when first bottled, it will be admitted that the only answer is—No.

With lemon juice, however, the answer is the reverse, and I shall go further and show you that the quantity of spirit added by the Board of Trade regulations is insufficient and useless for its preservation. Lemon juice, owing to the fact that it contains much more sugar and mucilage than lime juice, is more liable to fermentation, and in commerce it is always, or nearly always, found in a state of fermentation, and in this state it is passed by the Somerset House authorities, and sent into bond to be fortified and bottled for the Merchant Marine Service. In bond 15 *per cent. of proof spirit* is added to it, and this is expected not only to kill the fermentive germs, but to preserve it from further deterioration. As practical chemists and pharmacists I need scarcely tell you that to obtain the desired result double the quantity should be used. What percentage of alcohol do we add to our freshly pressed juices of dandelion, hemlock, broom, foxglove, henbane, etc.? Twenty-five per cent. at 56 over proof, which is equal to 39 per cent. at proof strength, and this quantity we only consider sufficient for the proper conservation of freshly pressed juices, quite free from fermentation. I have frequently seen bottles of lemon juice bursting in bond during hot summer weather, an hour or two after bottling, from the pressure of carbonic acid gas produced by the fermentation, and frequently cases have to be unpacked to replace bottles that have burst from the same cause, *in bond*. From this it is evident that lemon juice requires to be more strongly fortified, and my experience is that fully 30 per cent. of proof spirit, or better still, its equivalent of a stronger spirit, would be necessary.

I said that the experiment with the filtered and the unfiltered lime juice, to which I have already alluded, was put in hand for a different purpose than that of ascertaining whether or not the addition of alcohol was necessary for its preservation. The object in view was to ascertain whether the clarification of the juice was in any way detrimental to its keeping properties, and I was led to try the experiment by observing that clarified juice sooner became darker in colour, and sooner lost its fresh aroma than the unclarified, and the result showed that my suspicions were correct, though to a less extent than expected, for as already stated the clarified sample lost only 0·2 per cent. in citricity, while the unclarified sample remained intact at the end of twelve months. Why is this? To answer the question it is necessary to remember that in pressing lime or lemon juice many of the essential oil vessels of the rind are ruptured, and the oil thus escaping becomes to a considerable extent emulsified by the mucilage and sugar of the juice, thus acting as an antiseptic preservative to the juice.

It is chiefly owing to the presence of essential oil, thus emulsified, that the turbid appearance of fresh lime and lemon juice is due, and to my mind it is quite a mistake to insist upon juice being quite clear for ship use, since the filtration necessary to attain this would separate almost the whole of the essential oil, the presence of which adds so much to its keeping properties.

As already mentioned the chief use of lime juice is as a preventive and remedy for scurvy, and in the Royal Navy, only lime juice is used, with the gratifying result that the once dreadful disease is practically unknown. In the Merchant Marine Service, however, lemon juice is chiefly used, owing to its cheapness, and here cases of scurvy are frequently occurring. It is not, in my opinion, because lemon juice is inferior to lime juice as an antiscorbutic that this result is due, but simply to the fact that it soon becomes inert and useless by fermentation, as already shown.

Lime juice has become a therapeutic agent of so much importance since the publication of our present Pharmacopœia that its introduction into the next issue is almost a certainty, and in anticipation of such a result I would recommend that the test for citricity be fixed at not less than 7·25 per cent. of free citric acid.

DETERMINATION OF BORACIC ACID.*

BY EDGAR F. SMITH.

When a solution of manganese sulphate is added to one of borax, and to this mixture an equal volume of alcohol, there separates rapidly a white flocculent precipitate of manganese borate, MnB_4O_7, insoluble in the alcoholic liquid. The excess of manganese sulphate remains in solution, and can readily be determined in the filtrate from the borate after the expulsion of the alcohol. To ascertain whether the above might be available quantitatively, the following solutions of definite strength were prepared and the experiments recorded.

1. A solution of manganese sulphate, made by dissolving 3 grams of anhydrous $MnSO_4$ in 250 c.c. H_2O. 10 c.c. of this solution would then correspond to ·0600 gram $MnSO_4$.

2. Potassium permanganate solution of such strength that 18·5 c.c. were equivalent to 10 c.c. of I or 1 c.c. $KMnO_4$ = ·00324 gram $MnSO_4$.

3. Borax solution: 10 grams well-crystallized borax dissolved in 1 litre of H_2O.

The manner of conducting each experiment was as follows: To 10 c.c. of the borax solution were added 10 c.c. $MnSO_4$ solution and an equal volume of strong alcohol. The whole was well mixed, allowed to stand, carefully covered for one half hour, when the manganese borate was filtered rapidly (best with a suction pump) and washed well with alcohol. The filtrate and washings were placed in a platinum or porcelain dish and evaporated to dryness on a water-bath. The residual manganese was then determined according to Volhard's* method, by dissolving it in water, adding zinc sulphate, then heating to almost boiling, and carefully running in potassium permanganate until the liquid assumed a pink colour. The quantity of manganese sulphate thus found and deducted from the whole amount of the salt added, gave a difference representing the manganese sulphate which had combined with the borax. After calculating the amount of manganous oxide to which the sulphate, found by difference, is equivalent, the following equations were employed:—

$MnO : 2B_2O_3$ am't MnO : corresponding am't B_2O_3 (x); and

Orig. sub. 10 c.c. borax solution : x : : 100 : y (per cent. B_2O_3 in 10 c.c. of the borax solution).

Experiments.

Number of Anal.	Borax solution used.	$MnSO_4$ solution added.	$KMnO_4$ required.	$MnSO_4$ in excess.	$MnSO_4$ in combination with B_2O_3.	Per cent found of B_2O_3.
	cc.	cc.	cc.	gram.	gram.	
1	10	10	6·4	·0207	·0393	36·44
2	,,	,,	6·1	·0198	·0402	37·27
3	,,	,,	6·3	·0204	·0396	36·71
4	,,	,,	6·3	·0204	·0396	36·71
5	,,	,,	6·5	·0210	·0390	36·16
6	,,	,,	6·4	·0207	·0393	36·44
7	,,	,,	6·5	·0210	·0390	36·16
8	,,	,,	6·4	·0207	·0393	36·44
9	,,	,,	6·2	·0201	·0399	36·99
10	,,	,,	6·3	·0204	·0396	36·71
11	,,	,,	6·3	·0204	·0396	36·71
12	,,	,,	6·4	·0207	·0393	36·44
13	,,	,,	6·5	·0210	·0390	36·16
14	,,	,,	6·3	·0204	·0396	36·71
15	,,	,,	6·4	·0207	·0393	36·44
16	,,	,,	6·3	·0204	·0396	36·71
17	,,	,,	6·5	·0210	·0390	36·16
18	,,	,,	6·4	·0207	·0393	36·44

The calculated percentage of B_2O_3 in borax is 36·60, and from the experimental results it will be observed that the method can be successfully applied in the analysis of soluble borates.

In estimating the boracic acid in insoluble borates, as tourmaline, the following course was pursued. The finely pulverized substance was fused with a weighed quantity of pure sodium carbonate, the fused mass exhausted with water, and to the filtrate containing all the sodium borate, together with some sodium silicate and aluminate, was added an amount of pure ammonium sulphate molecularly equivalent to the sodium carbonate. The solution was then digested until all the ammonia was expelled and the volume of the liquid largely reduced. Any silicic acid or aluminium hydrate which had separated was now filtered off, and the precipitate thoroughly washed with hot water. The solution, again reduced in volume and containing only the borate and sulphate of sodium and excess of ammonium sulphate, was mixed with a definite amount of a manganese sulphate solution (strength previously determined), alcohol added, and after standing one half hour the borate was removed by filtration, the filtrate evaporated to dryness, and the residue carefully ignited to expel the ammonium salt. The manganese sulphate left was dissolved in water, and the same procedure as indicated in the preceding experiments was carried out.

* From *Am. Chem. Jour.*, October, 1882. Reprinted from the *American Journal of Pharmacy*, January, 1883.

* *Annalen der Chemie*, 198, p. 318.

The Pharmaceutical Journal.

SATURDAY, JANUARY 27, 1883.

Communications for the Editorial department of the Journal, books for review, etc. should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*

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THE DIGITALIN GROUP OF REMEDIES.

ANY one who has paid attention to recent literature relating to proposed new therapeutic agents must have been struck with the number of substances that have been recommended as possessing properties resembling those to which digitalis owes its value in the treatment of cardiac disease. These substances, however, while possessing points of resemblance in their physiological action, are derived from plants belonging to orders widely separated botanically, and differ considerably in their general chemical properties, although most of them have this character in common that they contain no nitrogen and are not acids. Indeed it is a remarkable fact that most of the extremely poisonous non-nitrogenous pharmacological agents derived from the vegetable kingdom belong either to the digitalin or the picrotoxin group; moreover, several members of the digitalin group yield decomposition products which in their action resemble picrotoxin. Whilst the action of some of these substances, and especially of digitalin, has now been fairly well studied, others have only been very imperfectly investigated, and it may be that valuable remedial agents are consequently in danger of relapsing into oblivion through the natural indisposition of medical practitioners to abandon a tried agent for the purpose of experimenting with others concernimg which little is known. Good service has, therefore, been rendered by Dr. SCHMIEDEBERG, to whom we owe much of our present knowledge of the active principles of digitalis, in contributing to the *Archiv für experimentelle Pathologie und Pharmakologie* an exhaustive and systematically arranged *résumé* of what is known concerning the group of powerful substances of which digitalin may be considered to be more or less the representative. Much of the information collected belongs strictly to the department of "pharmacology," as defined by Professor FRASER to be the "science of the action of remedies," and therefore need not be enlarged upon in these columns; but, besides this, there is information that may be classed under "pharmacognosy," to which reference may with advantage be made.

Dr. SCHMIEDEBERG enumerates fourteen substances as belonging to the digitalin group, and these he divides into four classes. Class I. consists of crystallizable glucosides, and includes digitalin, antiarin, helleborein, euonymin and thevetin. Class II. consists of non-glucosidal substances, not all crystallizable, and includes digitoxin, strophantin and apocynin. Class III. consists of non-crystalline glucosides, very slightly soluble in water: these are scillain, adonidin and oleandrin. Class IV. consists of amorphous glucosides, freely soluble in water and resembling saponin, and includes digitalein, apocynein and convallamarin. It may be mentioned with respect to the foregoing list that Dr. SCHMIEDEBERG has separated a glucoside that he has provisionally named "neriin," which appears to be probably identical with digitalein, from the *Nerium Oleander*, where it is accompanied by the less active glucoside which he has named "oleandrin." The "apocynin" and "apocynein" are the active constituents of the root of *Apocynum cannabinum*. A few other substances are mentioned, among which the most important are erythrophleine, the alkaloid of sassy bark, and neriodorin and neriodorein, the two glucosides separated by Mr. H. G. GREENISH from *Nerium odorum*, the latter two, it is thought possible, may upon closer investigation prove to be identical with oleandrin and digitalein (neriin).

As previously remarked the physiological action of the whole of these substances has not yet been thoroughly worked out, but enough is known to warrant their being classed together in one pharmacological group; for so far as has been at present ascertained they present no important difference in their action, beyond what consists in the different amount of effect produced by doses of equal weight, and their variations as to solubility in water and capability of absorption. Taking the action upon frogs' hearts as the starting-point for fresh investigations upon the digitalin group, Dr. SCHMIEDEBERG states the symptoms that all the members of the group are capable of producing, which may be briefly summarized as follows:—Augmentation of the volume of the pulse, under increase of the diastolic phase, and without any change in the absolute working power of the heart; irregular, "peristaltic" movements of the heart; systolic pause of the ventricle; and, finally, complete paralysis of the heart.

Dr. SCHMIEDEBERG raises the question whether when, as is usually the case, galenical preparations of digitalis are used, only the three constitutents known to belong to the digitalin group—digitalin, digitalein, and digitoxin—come into play, or whether other substances contained in the plant and in the official preparations exercise any influence; because, besides these three substances, there are other constituents, such as digitonin, digitaliresin and toxiresin, which belong to the picrotoxin group, the last two being decomposition products that are met with in the dried plant and may be formed in the intestinal canal through the splitting up of digitalin, digitalein and digitoxin. It is thought probable that digitonin

is present in too small quantity to be of therapeutic importance, but that digitaliresin and toxiresin may sometimes exercise a disturbing influence. Moreover, the three principal constituents of digitalis,—digitalin, digitalein and digitoxin,—are themselves absorbed with difficulty and slowly eliminated, and to this is due the so-called "cumulative action" which has been observed in connection with this drug, and which is believed to have led to an unusual number of fatalities.

In consideration of these facts in connection with the digitalin group, Dr. SCHMIEDEBERG is of opinion that in the interest of therapeutics and for the avoidance of great danger from too powerful action, it is of especial importance to use a chemically pure substance, which without producing local disturbance when injected subcutaneously, is readily absorbed, and through which, therefore, any desired degree of action could be maintained for a long time. Of the substances previously mentioned as belonging to the digitalin group he considers that in this respect the first places must be accorded to antiarin and thevetin, the former derived from the milky juice of the upas tree (*Antiaris toxicaria*), and the latter from the seed of the *Thevetia nereifolia*. Antiarin is not met with in commerce, and would be probably difficult to obtain, but thevetin might be more easily available. Of the digitalis constituents digitoxin would be excluded on account of its insolubility in water, which renders its absorption so irregular that the same dose on one occasion will produce little effect and on another will prove too powerful. Digitalin and digitalein are very difficult to prepare in a pure condition and would therefore be too costly. A similar remark applies to scillain, from the bulb of *Urginea scilla*, and adonidin, from *Adonis vernalis*, which are present in their respective plants in only very small proportions. Whether the material for the preparation of euonymin, which occurs in small quantity in the resin bearing the same name from *Euonymus atropurpureus*, or strophantin, from *Strophantus hispidus*, could be obtained at a moderate cost, and whether the preparation of these substances could be easily carried out, would have to be ascertained. But in the opinion of Dr. SCHMIEDEBERG the whole of the four last-named substances would be particularly well suited for internal use. According to experiments helleborein would appear to be more easily absorbed and also more easily eliminated than the majority of the substances of the group; in fact, so rapidly does this absorption and elimination go on, that when administered internally in such doses as produce a strong effect when administered subcutaneously it is quickly dispersed, and all but a small portion passes out of the system without producing any therapeutic effect. Convallamarin and apocynein rank, together with digitalein, in regard to their properties, near to helleborein, but hardly come within consideration, because on account of their amorphous character they are probably not so readily absorbed as helleborein.

There remain only oleandrin and apocynin to be mentioned, the former occurring abundantly in the oleander, which is widely distributed throughout the entire Mediterranean district, and the latter in the North American "Indian hemp" (*Apocynum cannabinum*). Both of these substances can be prepared sufficiently pure without special difficulty, the apocynin even more readily than the oleandrin, because it is not accompanied by decomposition products so troublesome to separate. On account of their comparative insolubility these two substances are suitable only for internal use. In respect to their characters they agree essentially with one another, but they give different decomposition products. Oleandrin is a glucoside, splitting up when heated with dilute acids into sugar and "oleandresin," possessing an action similar to digitalresin; on the other hand apocynin, under the same treatment, passes into an inactive substance. Whether this difference will be of any consequence in the treatment of disease requires to be ascertained by experiment, when the relative capability of absorption of the two substances should also be studied.

The Junior Pharmacy Ball, held on Wednesday evening last at Willis's Rooms, passed off with great success, as many as 370 persons having been present. A telegram from Mr. M. Carteighe was read, regretting that through being engaged in attending a meeting of the Board of Examiners in Edinburgh he was unable to be present. In his absence the toasts of "The Royal Family," and "Success to the Junior Chemists' Ball," were proposed by Professor Attfield.

* * *

The Medical Union Society, which has been established with the object of furnishing "a means of intercommunication and organization" for students and junior members of the medical profession, will hold its first annual meeting and *soirée* in the Holborn Town Hall, on Wednesday next, the 31st inst. At 8 o'clock Dr. B. W. Richardson will deliver an address to students of medicine, after which there will be a vocal and instrumental concert.

* * *

At the meeting of the Chemical Society on Thursday next, February 1, a paper is to be read on "Some Derivatives of Fluorene," by Messrs. Hodgkinson and Matthews. There will also be a ballot for the election of Fellows.

* * *

On the same evening, at 8 p.m., a meeting of the School of Pharmacy Students' Association will be held, when some "Dispensing Notes" will be read by Mr. W. Johnston. A report upon "Secondary Batteries," illustrated by experiments, will be made by the Reporter on Physics, Mr. H. Allen, B.Sc.

* * *

A meeting of the Chemists' Assistants' Association will be held at University Chambers, 53, Conduit Street, on Wednesday evening, January 31, at 8.30 p.m., when a paper will be read by Mr. F. H. Alcock, "On Glycerine and its Application to Pharmacy."

The Annual Dinner of this Association is fixed to take place at the Holborn Restaurant, on Wednesday, February 14. Mr. M. Carteighe is to preside.

* * *

A series of six lectures on "Solid and Liquid Illuminating Agents," by Mr. Leopold Field, will be commenced in the Lecture Room of the Society of Arts on Monday next, the 29th inst. The lectures will constitute the second course of "Cantor Lectures" for the present session.

* * *

At the last meeting of the Newcastle-upon-Tyne Chemical Society it was decided by 52 votes out of 65 that the Society should be amalgamated with the Society of Chemical Industry, and a Committee was entrusted with the arrangement of matters of detail.

* * *

According to a note received from our esteemed correspondent, Dr. J. E. De Vrij, the International Colonial and Export Trade Exhibition which is to commence next May in Amsterdam promises to be very rich in subjects of interest to pharmacists. Dr. De Vrij suggests that intending visitors would do well to fix their head-quarters at Harlem, where they would be within a dozen miles' railway ride of the capital and conveniently situated for visiting the Colonial Museum in the town. Any way, as the demand for accommodation in Amsterdam will probably be excessive, it will be as well, if it be intended to stop in the city, to secure apartments beforehand.

* * *

An American contemporary, after referring to the International Pharmaceutical Exhibition to be held in Vienna this year, expresses an opinion that it might be desirable that it should be followed by another to be held in New York or Philadelphia in 1884 or 1885.

* * *

A lively sensation appears to have been produced in Paris, by a statement that some of the sulphate of quinine supplied to the French hospitals contains as much as 43 per cent. of cinchonine. *L'Union Pharmaceutique*, commenting upon the subject, appears to throw the blame upon the system which allows the public service to be supplied with foreign quinine by contractors who are incapable of detecting a fraudulent substitution if they wished to do so.

* * *

In an article on the deleterious effect of "cram," as carried on in elementary schools, the *Lancet* quotes statistics from various large towns in Scotland to show that there has been an increase in the mortality among children of five years old up to youths of twenty in the ten years during which the Education Act has been in operation as compared with the ten years immediately previous. In Aberdeen it has risen from 7·5 per cent. to 9·2 per cent.; in Edinburgh from 6·5 per cent. to 7·5 per cent.; in Glasgow from 5·5 per cent. to 7·25 per cent.; and in Dundee from 5 per cent. to 8·5 per cent.

* * *

The list of students in the Philadelphia College of Pharmacy for the Sixty-second Annual Session, 1882-83, shows that there are 254 "matriculants" in the "Junior Class" and 191 in the Senior Class.

* * *

The Municipal Council of the city of Paris, at a recent sitting, adopted a proposition to institute for the convenience of the public a night pharmaceutical service, upon the model of the night medical service, and a vote of 3000 francs has been inserted in the municipal budget to cover the expenses.

* * *

There are now in the United States two journals devoted to pharmacy printed in the German language. The *Deutsch-Amerikanische Apotheker-Zeitung* is published in New York twice a month and is now in the third year of its existence. The *Pharmaceutische Rundschau und Zeitung* has made its first bow with the opening of the present year. It also is published in New York; it is to appear monthly, and is to be edited by Dr. F. Hoffmann.

* * *

On the other hand two of the multitudinous United States journals printed in English,—the *Weekly Drug News* and the *American Pharmacist*,—having changed hands and become the property of one person, are henceforth to be consolidated. One of the "features" of the new journal, as stated in the opening number, is to be the printing of the papers read at the evening meetings of the Pharmaceutical Society of Great Britain, together with the consequent discussions. It may be mentioned that in carrying out this arrangement nearly twenty columns, out of thirty-nine which constitute the first number, have evidently been quoted from this Journal; but apparently the programme does not yet include an acknowledgment of the source.

* * *

The *St. Louis Druggist*, referring to Mr. Holmes's paper on "Spurious and Worthless Drugs," and "the excitement existing in pharmaceutical circles in England" upon the subject, congratulates its fellow citizens upon the better protection they enjoy from the importation of rubbish from without, but laments the damage done from within through the disposal by the Government of old medical stores, including tinctures and pills bought during the civil war nearly twenty years ago.

* * *

The same journal, in quoting the first instalment of Mr. Proctor's address on "Atoms and Molecules," introduces it as the production of "Professor Barnum S. Proctor."

* * *

Specialism in medicine is now to be extended to the medical journals. The *Monthly Journal of Medicine and Pharmacy*, a Philadelphia journal which for some time past has claimed to be devoted especially to quinological subjects, has undergone a change of title, and is henceforth to be called, "*The Quinologist.*"

* * *

On the recommendation contained in a report presented to the Paris Society of Pharmacy by M. Gérard, the prize for the competitive theses presented by pupils in the Paris School of Pharmacy last session has been awarded to M. Guinochet, for a treatise on the "Aconitates," in which he describes at least twenty new salts of aconitic acid.

* * *

The name of Mr. John Babtie, Pharmaceutical Chemist and Provost of Dumbarton, has been added to the Commission of the Peace for the County of Dumbarton on the recommendation of the Lord-Lieutenant of Dumbartonshire.

* * *

Information has been received of the death on the 5th inst. of Mr. John Barker, who was elected an Annuitant on the Benevolent Fund in 1880.

Transactions of the Pharmaceutical Society.

PRELIMINARY EXAMINATION.

At a meeting of the Board of Examiners for England and Wales, held on Monday, January 22, 1883, the undermentioncd certificates were received in lieu of the Society's examination:—

Certificates of the College of Preceptors.

Aplin, John Henry .....Chard.
Bowell, Horace James Whitney.Ilfracombe.
Churchouse, Charles Herbert...Chard.
Hoare, Austin .....Ilfracombe.

Certificates of the University of Cambridge.

Painter, Frederick Hubert .....London.
Wilson, Robert John ....Chesterfield.

Certificate of the University of Oxford.

Fryer, Charles John .....Warwick.

The report of the College of Preceptors on the examination held on January 2nd was received.

Three hundred and thirty-one candidates had presented themselves for examination, of whom *one hundred and thirty-seven* had failed. The following *one hundred and ninety-four* passed, and the Registrar was authorized to place their names upon the Register of Apprentices or Students:—

Abram, Fred. Wm. Joseph.....Wisbech.
Ainley, Edward Theodore .....Mirfield.
Alexander, Charles Angus .....Glasgow.
Allen, William Henry Arthur...Norwich.
Allen, Willie.....Basingstoke.
Almack, Edward Ambrose .....Bedale.
Ames, William Ralph .....Bath.
Asten, Walter .....Birmingham.
Atkins, Frederick John .....Royston.
Badcock, Hy. John Francis ...Sheerness.
Bainton, Arthur .....Manchester.
Baker, William Herbert .....Cosham.
Ball, George .....Manchester.
Ball, John Arthur .....Nottingham.
Bamford, Thomas.....Aberavon.
Barnes, George Arthur .....Heckington.
Barr, Bryce .....Largs.
Bindloss, George Warren .....London.
Blakelock, John William.....Edinburgh.
Bland, Arthur Whitsed .....Walsall.
Blankley, George William .....Arnold.
Blewett, William Thomas .....Penzance.
Bostock, John .....Wilderspool.
Branch, Alfred Ernest.....Colchester.
Branson, Preston James .....Plympton.
Brearley, Wentworth James L.Farnworth.
Brislee, William Henry .....Liverpool.
Broad, Henry Reynolds .....Kidderminster.
Brown, Robert Wells ....Glasgow.
Buck, Edward Thomas .....Goole.
Butterworth, Robt. H. SmethurstBlackpool.
Cadman, Ernest S. Radford ...Horsley Woodhouse.
Casewell, Job Parry.....Market Drayton.
Castell, Guy John Edward .....Daventry.
Chantry, John Henry ....Horncastle.
Charlesworth, H. Hodgkinson...Tunstall.
Clarke, James ....Liverpool.
Clarke, Joseph .....Birmingham.
Clements, Robert James.....Kingsbridge.
Clough, Thomas .....Liverpool.
Coates, Robert .....Pickering.
Coleman, Joseph .....Birkdale.
Cooper, John.....Castletown.
Cruickshank, Gavin Lang .....Aberdeen.
Cumber, Edwin Guille.....Guernsey.
Dakers, John Israel.....Newcastle-on-Tyne.
Darby, William .....Spalding.
Davies, Colin Campbell .....Llandyssil.
Davies, Henry .....Dowlais.
Davies, Oliver .....Pontypridd.
Davies, Roger Edward.....Corwen.
Dawson, Edwin, jun. .....Stamford.
Dick, David Laing .....Falkirk.
Dodgson, Fred Henry .....London.
Donach, James.....Moffat.
Douglas, William Boyce .....Torquay.
Duggleby, Albert Waldby .....Lowthorpe.
Elmitt, William .....Lincoln.
Emmons, Charles.....Kidsgrove.
Enderby, John Edward .....Spalding.
England, Reginald Arthur.....London.
Escritt, Harold Teal .....Driffield.
Evans, Abdiel Charles.....Ewell.
Evans, Frederic Ernest .....Lymm.
Everett, Walter John .....London.
Eyre, William Robert.....Ashbourne.
Fairburn, Henry .....Hutton Bonville.
Fanshaw, William John.....Wolverhampton.
Fardell, Ernest Matthew .....Leicester.
Featherstone, Robert Horne ...Derby.
Field, Ebenezer .....Cambridge.
Fraser, John Sutherland.....Forres.
Freeman, John.....London.
Fuller, George Sydney.....Thornton Heath.
Gage, Leonard Charles .....Basingstoke.
Garner, David .....Garston.
Gatehouse, William.....London.
Green, Herbert.....Hucknall Torkard.
Griffiths, Henry Thomas.....St. Clears.
Gwynne, Samuel .....Leek.
Hacon, Elizabeth Constance ...London.
Haden, Thomas Henry .....Barnsley.
Hague, John James... .....Ashton-under-Lyne.
Haigh, Walter .....Halifax.
Hall, Allen Joseph .....Coventry.
Hall, John.....Aberdeen.
Harris, Herbert .....Kirton Lindsey.
Harard, Henry Lewis .....Penclawdd.
Harvey, James .....Flintham
Hays, Frederick Arthur .....Birmingham.
Hayton, William Pattinson ...Wigton.
Heading, Charles .....Downham.
Hector, Alexander B. .....Aberdeen.
Henderson, Henry Alfred .....Wibsey.
Higson, Joseph ..... Blackburn.
Hill, Blair .....Edinburgh.
Hodge, John George .....Galashiels.
Holbeche, Harry .....Stottesden.
Holt, Herbert Collins .....Bowdon.
Horne, George Herbert .....Scarborough.
Horne, John Kay.....Accrington.
Horne, Joseph .....Aberdeen.
Hughes, John Alfred ....Holywell.
Huntley, Joseph .....Cirencester.
Hutchinson, Edgar .....Newark.
Jackson, Albert Ernest .....Ipswich.
Jackson, Ben Leslie..... .....Longton.
Jackson, Oliver Lincoln .....Blackpool.
Johnstone, Edward Straus .....Whaley Bridge.
Jones, David John .....Cefn Coed.
Jones, Frederick .....Coalville.
Jones, William Owen .....Market Drayton.
Jones, William Rowland.....Hay.
Kay, Charles William .....Leeds.
King, Alexander William .....Ayr.
Kingston, Percy John .....London.
Kingston, William Richard ...London.
Knowles, Louis.....Leicester.
Laughlin, Alfred William .....Ramsey, I.M.
Laurence, John, jun. .....Glasgow.
Lavery, Charles .....Dumbarton.

Laycock, James .....Bradford,
Litchfield, John Henry .....Ashford.
Lovegrove, Wallis Sheffield.....Crawley.
Low, Alexander Taylor ..... Alva.
McCorquodale, John Campbell...Dumbarton.
McDonald, James.....Dundee.
Macleod, Lewis.....Inverness.
McMaster, Thomas .....Stranraer.
Mason, Joseph Edwin .....Bexley Heath.
Mate, Richard Arnold.....Crewe.
Mather, James Smith ....Arbroath.
Maxwell, John .....Roxburgh.
Morris, Ernest William .. ..Market Harborough.
Morris, James Kneeshaw .....Scarborough.
Muddell, Claude .....Southend-on-Sea.
Munns, Henry Ernest.....Birmingham.
Murfet, Edward ....King's Lynn.
Naylor, Edward Alfred .....Scarborough.
Norton, Edward Thomas.....Stow-on-the-Wold.
Nursaw, Francis Theakston ...York.
Parsons, Alfred George .....Exeter.
Parton, John Henry .....London.
Perkins, Frank .....Newcastle-under-Lyme.
Perrett, Samuel .....Bridgwater.
Phillips, Arthur Sydney .....Mitcheldean.
Pick, Alfred .....Chester-le-Street.
Pierce, Michael.....Croydon.
Price, Charles John .....Devizes.
Pridham, Charles Clifford .....Bath.
Rawlinson, William Bright ...Harwich.
Rees, Joseph .....Brynamman.
Renshaw, Frank .....Rochdale.
Reynolds, Philip .....Spalding.
Rippon, Richard Waller .....Leamington.
Robinson, Raymond.....London.
Robson, Thomas .....Hartlepool.
Rossiter, Percy Alex. .....London.
Russell, John .....Broughty Ferry.
Ryott, Harry William .....Gilesgate Moor.
Saunders, Edmund Thomas ...Newport Pagnell.
Sayers, William Charles.....London.
Selle, Louis Sherwood .....Hull.
Shenston, Robert .....Kenton.
Sinclair, Matilda Anne .....Llandudno.
Smith, Henry .....Durham.
Smith, Robert .....Earlestown.
Smith, Walter Woodhouse.....Doncaster.
Stevenson, George Shields C....Portobello.
Strachan, John.....Aberdeen.
Stuart, William .....Preston.
Sykes, John .....Southport,
Tabor, Thomas Slade .....London.
Taylor, Edward .....Weymouth.
Thom, James .....Edinburgh.
Thompson, James Ebenezer ...Hexham.
Tod, James A. .....Edinburgh.
Tomlinson, Charles Parker.....Peterborough.
Toone, Edwards Roberts.....Bath.
Trickey, Alexander Leslie .....London.
Wain, Charles Oliver .....Bolton.
Watt, Arthur .....Edinburgh.
Weatherston, Francis B.....Peebles.
West, Cecil .....Retford.
Wheatcroft, Hoyland .....Rotherham.
Wheen, Harold.....Bridlington Quay.
Whitbread, Howard.....Loughborough.
Wilcock, Fred Anderton.....Bradford.
Wilkinson, Frank.....Nottingham.
Williams, Chalmers .....Carmarthen.
Wilson, William Potter .....Haddington.
Wood, John William .....Darlington.
Wride, William Blake.....Shirley.
Young, Edward .....Sudbury.

The following is a list of the centres at which the examination was held, showing the number of candidates at each centre and the result:—

	Candidates. Examined.	Passed.	Failed.
Aberdeen	10	5	5
Birmingham	19	12	7
Brighton	2	0	2
Bristol	7	6	1
Cambridge	5	2	3
Canterbury	2	1	1
Cardiff	14	6	8
Carlisle	4	1	3
Carmarthen	8	4	4
Carnarvon	6	1	5
Cheltenham	1	1	0
Darlington	6	4	2
Douglas	3	2	1
Dundee	3	3	0
Edinburgh	19	12	7
Exeter	11	6	5
Glasgow	14	10	4
Guernsey	3	1	2
Hull	8	5	3
Inverness	2	2	0
Lancaster	2	1	1
Leeds	22	16	6
Lincoln	6	5	1
Liverpool	16	11	5
London	40	24	16
Manchester	25	15	10
Newcastle-on-T.	7	4	3
Northampton	3	3	0
Norwich	6	2	4
Nottingham	16	12	4
Oxford	1	1	0
Peterborough	9	7	2
Sheffield	8	4	4
Shrewsbury	5	3	2
Southampton	5	4	1
Truro	2	1	1
Worcester	3	1	2
York	8	6	2

The questions for examination were as follows:—

Time allowed: *Three Hours for the three subjects.*

I. LATIN.

1. Translate into English:—

(i.) Cæsari quum id nuntiatum esset, maturat ab urbe proficisci. (ii.) Omnis civitas Helvetia in quatuor pagos divisa est. (iii.) His responsis ad Cæsarem relatis, iterum ad eum Cæsar legatos cum his mandatis mittit. (iv.) Septimo die, quum iter non intermitteret, ad exploratoribus certior factus est, Ariovisti copias a nostris millibus passuum iv. et xx. abesse. (v.) Hæc eodem tempore Cæsari mandata referebantur, et legati ab Æduis et a Treviris veniebant: Ædui questum, quod Harudes, qui nuper in Galliam transportati essent, fines eorum popularentur; sese ne obsidibus quidem datis pacem Ariovisti redimere potuisse: Treviri autem, pagos centum Suevorum ad ripas Rheni consedisse, qui Rhenum transire conarentur: his præesse Nasuam et Cimberium fratres.

2. Parse fully:—"Omnis civitas Helvetia in quatuor pagos divisa est."

3. In extract (v.) account for the mood of *transportati essent* and *potuisse*, and for the case of *obsidibus* and *his*.

4. Translate into Latin:—(i.) There remained one way by which they could go out. (ii.) He set out from the camp with three legions. (iii.) There is no doubt that you have acted very ill. (iv.) Having heard these things, he led his army to the banks of the river.

II. ARITHMETIC.

[The working of these examples, as well as the answers, must be written out in full.]

1. A person buys a tub of butter, weighing 3 qrs. 16 lbs., for £4 2*s*. 6*d*.; the weight of the tub is 10 lbs.; how much does the butter cost him per lb.?

2. What sum must be added to

$$2\tfrac{1}{3}+\frac{3\tfrac{1}{3}-\tfrac{1}{6}}{3\tfrac{1}{3}+\tfrac{1}{6}}-2\tfrac{5}{7} \text{ of } \tfrac{4}{15}$$

that the sum may be equal to 3?

3. From 37 take ·37 and ·037, add the two results together, and divide the sum by 370.

4. If $3\frac{1}{2}$ sacks of 3 bushels each cost 31*s*. 6*d*., find the cost of $10\frac{1}{4}$ sacks of $2\frac{1}{2}$ bushels each.

5. At what rate per cent. will the interest on £600 amount to £70 in 2 years 4 months?

III. ENGLISH.

1. Define an *abstract noun*; and form abstract nouns from the following words:—*steal*, *just*, *good*, *know*, *consider*.

2. There are adverbs of time, place, manner, and degree. Mention one of each, and expand the one you

give into (i.) an adverbial clause, (ii.) an adverbial sentence.

3. Parse fully the following sentence:—

"Pause a while,
And let my counsel sway you in this case."

4. Write a short composition on one of the following subjects:—

(i.) Christmas-tide.
(ii.) Illustrated Newspapers.
(iii.) Letter-writing.
(iv.) The recent Campaign in Egypt.

NORTH BRITISH BRANCH.

EVENING MEETING.

The third evening meeting of the session was held in the Society's rooms, 119A, George Street, Edinburgh, on Wednesday evening, January 17, at 9 o'clock.

Mr. Alexander Napier, President of the Branch, in the chair.

The minutes of the former meeting having been read and confirmed,

The Secretary to the Branch intimated the following donations to the library:—

Journal of the Chemical Society, five parts to complete volumes.
From the Pharmaceutical Society.

Canadian Pharmaceutical Journal, two parts completing volume for 1882.
From the Ontario College of Pharmacy.

'Year-Book of Pharmacy and Transactions of the British Pharmaceutical Conference,' 1882.
From the Committee of Publication.

For these donations a vote of thanks was moved by the President, and cordially responded to by the meeting.

Mr. William Gilmour then read a paper entitled "Notes on the New Edition of the United States Pharmacopœia."

In the introductory remarks he referred to the constitution of the Committee of Revision as being the best calculated to produce a thoroughly practical work, since a large number of the members were practical pharmacists. He spoke of the duties assigned to the committee and the mode in which they had conducted their labours, and then proceeded to comment upon the Pharmacopœia itself. Some remarks were made on the omission of fluid measure, and the adoption of decimal parts by weight for solids and liquids, so that the use of metric or troy weights, according to the taste of the pharmacist, was practical. Under this heading the influence of the change on the strength of various preparations was brought out, and the exceptions to the rule instanced; in the case of pills, for example, where the quantities in troy and metric weights are given in parallel columns, the product in both cases being for a definite number of pills. In speaking of fluid extracts he referred to the concise yet full directions given regarding the degree of comminution required for the drug used; the choice of a menstruum best calculated to ensure exhaustion according to the nature of the drug, and the various circumstances modifying the percolation process. Regarding the articles of materia medica, additions and omissions were noted, and the concise designation given to each article by adopting the name of the species only, thus leaving out the generic name as well as the name of the part used. It was here remarked that a plentiful adoption of synonyms served to remove any doubt which might arise regarding any given drug. He then referred to the chemical portion of the Pharmacopœia, on which he will treat in a second paper.

The President, in moving a vote of thanks to Mr. Gilmour, said that he was not in a position to remark on the subject, not having read the new Pharmacopœia; he hoped, however, that when Mr. Gilmour brought forward his second paper, he would have an opportunity of discussing the matter.

Mr. Stephenson said that he was sure the meeting was much indebted to Mr. Gilmour for having brought this subject under their notice, and he cordially acquiesced in the President's motion. He had had an opportunity of glancing through the work, but as his acquaintance with it was only that of a few hours, he could not venture to speak of it in a detailed way. He had been anxious chiefly to see how far it corresponded with or diverged from the British Pharmacopœia, and the first difference he noted was the substitution of weight for measure (except to a very limited extent) and the adoption of decimal parts in all the formulæ. The advantages as well as the disadvantages of this change were obvious, but the latter might have been greatly lessened by having specific weights alongside the decimal parts. Then he observed that the minim admitted as the unit of measure for physicians in prescribing differed from ours. He did not know if this minim was introduced for the first time. If it was surely it would have been well to adopt ours, as the basis of it was quite arbitrary. Then the pulv. aromaticus was our P. cinnam. co., but with the addition of nutmeg, not a judicious one, he thought. Another important variation was in tinct. opii, which was ordered as *one* of powdered opium to ten (10) of product. He noted the entire absence of the juices of herbs, whether as succi or for the preparation of extracts, although there was a general formula for tinctures from fresh herbs. Percolation was almost uniformly enjoined, and it was puzzling to find that tinct. myrrh was made an exception. The directions for conducting the process were very elaborate and did not appear to make much allowance for the intelligence of the pharmacist. One of these details he took objection to, viz., the passing the menstruum through the substance until a measured quantity of product is obtained instead of pressing the marc, and making up the required measure afterwards, and so avoiding waste of spirit. He also referred to the preparation of resin of scammony from the gum resin instead of from the root as a wasteful process. He pointed out that in the fluid extracts spirit of different strengths was the solvent, that they were indeed concentrated tinctures while our own were more like concentrated infusions, spirit being only added as a preservative. He had noted also the entire absence of the geographical sources of all articles of vegetable and animal origin. He concluded by referring to the very copious tables of thermometric equivalents, solubilities, saturating powers, etc., which were appended to the work, but while admitting their value he thought it was open to question whether a national pharmacopœia was exactly the place for them.

Mr. J. R. Young said that he had pleasure in listening to Mr. Gilmour's paper, and to Mr. Stephenson's remarks on the new Pharmacopœia of their American brethren. Probably Mr. Gilmour would be able in his next paper to reply to Mr. Stephenson's criticism. He remarked that probably the best pharmacists are those of the United States, and although they may differ considerably from us, we must not suppose that all these differences are bad. He had often admired their way of dealing with galenical preparations, more especially their tinctures and the like. He was struck with the remark of Mr. Gilmour's that the methods of preparing the different alkaloids were omitted; probably this was due to the fact that there were many eminent chemists in the United States, and an assumption thereby that pharmacists did not require to prepare such articles as alkaloids.

The President remarked that he had observed the reason for the omission of directions for the preparation of aconitine was the varying nature of that body, some commercial specimens being 170 stronger than others; they, therefore, tend to adhere more closely to galenical

preparations of the strong drugs, which he thought was a very wise tendency.

A paper was then read by Mr. Peter MacEwan, Secretary to the Branch, on—

Pungent Liniment of Iodine.

Some time ago, I had given to me for examination a few drachms of liniment of iodine, which emitted a pungent and irritating vapour when applied to the skin, the vapour smarting and inflaming the eyes very painfully. Complaints have frequently been made of this liniment, owing to its incomplete absorption by the cuticle and the subsequent volatilization of the iodine, which may in some circumstances cause irritation; but in the case which I cite, the vapour was distinct from that of iodine, and suggested that the liniment had undergone decomposition. Old specimens of the official liniment do not differ materially in odour from that of the preparation when freshly made, so that it would appear that the difference shown in the specimen under examination was due to some objectionable modification of the official formula.

From the well-known fact that methylated spirit is used in the preparation of certain liniments, it was natural to presume that the pungent liniment may have been prepared with it. One drachm of this liniment was, therefore, decolorized with potash solution and distilled. The distillate, subjected to Miller's process for detecting the methyl base, gave a faint mirror with nitrate of silver. Subsequent applications of the test, however, showed it to be untrustworthy. A quantity of the liniment was therefore prepared with methylated spirit for comparison with the specimen given to me. This, at the time of preparation differed but slightly from the official liniment, the naphtha odour being partially masked, but in three weeks it became pungent and in every way similar to the objectionable specimen.

In the course of several experiments, directed to ascertain the ingredients of the liniment influencing the decomposition, it was observed that when a small quantity of pure liniment was carefully dropped on a little water contained in a porcelain dish, a flocculent substance separated and floated on the surface, assuming in a few seconds a crystalline appearance. Under the microscope this was seen to be made up of colourless fan-shaped crystals. This particular form of crystal is not given by alcoholic solution of camphor or of iodine. The crystals are probably an iodated camphor, and are of interest here, from the fact that the pungent liniment does not yield them, but an oily like fluid which floats on the surface for a few minutes, afterwards sinking and adhering to the bottom of the dish. This fluid possessed in a high degree the pungency of the liniment. As a careful microscopic examination of the oily fluid and the water surrounding it showed entire absence of crystals, it was assumed that the camphor had in some way influenced the development of pungency. In corroboration of this supposition a quantity of methylated liniment was prepared without camphor, and in this no pungency has been developed in a period corresponding to that in which the liniment containing camphor became pungent.

It is well known that wood spirit, used to methylate pure spirit, contains several bodies as impurities which undergo slow decomposition in presence of any foreign matter. This fact suggested that it is these impurities and not the methyl alcohol which are decomposed in presence of camphor and iodine. To prove this a quantity of the liniment was prepared with rectified spirit to which 10 per cent. of pure methyl alcohol had been added, and no pungency has been developed in the preparation.

I have not, meanwhile, directed any experiments to determine the constitution of the pungent oily compound, as this paper is merely intended to show that methylated spirit is not a fit substitute for rectified spirit in the preparation of liniment of iodine. I may, however, remark that allyl alcohol is one of the impurities of wood spirit and the pungent and irritating nature of the iodo-allyl compounds would indicate the formation of some such body under the conditions already stated. This, however, I hope to ascertain in future experiment with allyl alcohol and the other bodies constituting the impurities referred to.

The President said that the meeting was much indebted to the Secretary for his interesting paper, and he had much pleasure in moving a vote of thanks to him. He did not think that the use of methylated spirit was at all common, particularly in the preparation of iodine liniment.

Mr. Gilmour seconded the motion, and remarked that he had his attention called to the subject some time ago when a specimen of iodine liniment, such as had been described, was shown to him; the pungency reminded him very much of essential oil of mustard. The paper now read recalled the matter to him, and he thought from what he had himself observed that the cause of the pungency was very probably what had been hinted at, namely, allyl alcohol. He did not think that anyone with a reputation to lose would think of preparing his iodine liniment with methylated spirit, knowing the exceedingly annoying odour which was developed in it.

Mr. J. R. Hill said that the paper was of special interest to him for it explained a circumstance which had lately come under his observation. A person had applied for a preparation of iodine to be used for a dog, and he had been unable to satisfy the person even with the pharmacopœial liniment, which was alleged not to be strong enough. This person gave him a small quantity of a preparation supplied by a veterinary surgeon, and which was comparatively weak in iodine, but had an extremely pungent odour, from which the person had judged its strength. This odour was at first thought to be due to oil of mustard, and a careful examination showed the presence of methylated spirit; Mr. McEwan's experience corroborated his own conjecture on this point. He thought that the suggestion made about the crystals referred to in this paper being an iodo-camphor compound was very probable. Similar crystals were given when an alcoholic solution of bromo-camphor was mixed with water, and the likeness exhibited by halogen compounds generally favoured this supposition. He threw out the suggestion that iodo-camphor is first formed in methylated liniment, and the subsequent action of this on allyl alcohol produces this pungency.

Presentation of a Bust of the late Mr. H. C. Baildon.

After the reading of the papers the attention of the meeting was called to a bust of the late Mr. H. C. Baildon, presented by his son, Mr. H. B. Baildon.

The President, in accepting the gift in the name of the Council of the Branch, said that all who had known the late Mr. Baildon knew how thoroughly he had identified himself with the Branch, and how he had interested himself regarding all matters affecting its welfare. As a President of the Branch he had been greatly esteemed by the members, and his cultured mind and gentlemanly bearing lent a dignity to all matters he took part in. It pleased him highly to think that the son of their late friend showed by the gift his interest in the Branch and his attachment of pharmacy, and he had much pleasure in moving a cordial vote of thanks to him, and expressed the gratification which the Council had in placing such a fitting memorial of their late co-worker beside those of others who had in their lifetime been true friends of the North British Branch.

Mr. Young, in seconding this motion, said that he did so with feelings of pleasure and regret, for he had been intimately acquainted with the late Mr. Baildon, and

the striking likeness presented by the bust recalled to him many happy meetings. Although Mr. Baildon was of English birth and training, he had spent the greater part of his life in Scotland, and though he was an English gentleman to the last, he was sure that no one had had the interests of Scotch pharmacy more at heart than he had. It pleased him very much to see so fitting a memorial presented to the Branch, and he felt himself indebted to the donor for the handsome gift.

Messrs. Ainslie and Stephenson having made a few remarks, Mr. H. B. Baildon, replied. In the course of his remarks he said that he hoped he would be enabled to merit in some measure the esteem and respect which had been accorded to his father, and he could assure those present that he appreciated the honour which was conferred upon his father in the placing of a memorial of him within the rooms of the Branch.

Before the meeting separated, the members had an opportunity of examining a collection of specimens of new drugs, exhibited by Messrs. Thomas Christy and Co., London, and which had remained in the rooms after their exhibition before the Assistants' Association.

Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

The seventh general meeting of the above Association was held at the Royal Institution on Thursday, January 18. The chair was occupied by the President, Mr. Joseph Woodcock.

The minutes of the last two meetings were read and confirmed, and the following donations announced :— The 'Pharmacopœa Germanica,' 1882, and the 'United States Pharmacopœia,' 1882, from Messrs. Evans, Sons and Co.; the 'Year Book of Pharmacy' from the members of the Pharmaceutical Conference; the *Pharmaceutical Journal* from the Society, and the *Canadian Pharmaceutical Journal* from the Editor.

The President, in proposing a vote of thanks to the donors, alluded particularly to the liberality of Messrs. Evans, Sons and Co., in presenting the new Pharmacopœias, which few had as yet been able to obtain.

The President then called upon Mr. Conroy to read his paper, entitled—

Lime Juice: its Properties and Uses.

Dr. Symes, in proposing a vote of thanks, said the Association was much indebted to Mr. Conroy for his interesting and practical paper. Practical papers were always valuable, but this one was particularly so, as probably no one had had more experience in testing lime juice than Mr. Conroy. He would like to know if the size of the limes named by Mr. Conroy was peculiar to Montserrat, as he had seen some limes which were about twice the size of ordinary lemons. He would also like to know whether Mr. Conroy had found lime juice to vary in citricity according to the season of the year. Lemons in summer time scarcely contained any citric acid, whereas in the winter they held about as much as limes. Regarding the preservation of lime and lemon juice, he believed that the former was certainly more readily preserved than the latter. About twenty years ago he had published in the *Pharmaceutical Journal* the results of some investigations which he had made in connection with this subject, and he then found that by clarifying the lemon juice, heating for about ten minutes at a temperature of 150° Fahr., and then corking quickly and sealing over with beeswax, the juice would keep well for many months without the addition of any alcohol. If heated over the temperature named the juice was apt to become brown. Juice thus bottled in the winter, when the citricity was at the highest, was available in the summer time for effervescing drinks, when lemons contained hardly any citric acid. Dr. Symes, while admitting the beneficial results of using lime juice on board ships as a preventive of and cure for scurvy, thought that the decrease of that dread disease was also due in some measure to the fact that in the naval service, and to some extent in the merchant service also, it was now felt that, if the sailors were to be kept healthy, they must have food supplied to them which contained in larger proportions the constituents of vegetable juices and such principles as creatine and creatinine, found in meat juice. Compressed vegetables, tinned meats and fruits were now more frequently served out to the men. In reference to the respective therapeutic properties of lime and lemon juice, he did not think that the larger number of cases of scurvy in the merchant service was altogether due to the inferior qualities of the lemon juice as compared with lime juice, but because on the vessels of the Royal Navy the men were bound to take the juice which was handed to them, whereas in the merchant service, when given, out it was frequently used by the men for washing the decks instead of being taken.

Mr. A. C. Abraham, in seconding the vote of thanks, asked whether the bottles used in the experiments were full or otherwise, as he found from experience that if lemon juice were bottled quickly after pressing, and before it had time to absorb any germs from the air, it would keep for a considerable length of time in an unimpaired condition. In reference to the fortifying of the juice in bond, he had always understood that rum was ordered by the Board of Trade, and not simply proof spirit. Rum contained a certain quantity of essential oil or ethereal compounds, which no doubt would have considerable preservative power; but that, of course, was a question which would hardly be thought of when the law was drawn up, and the authorities might not have considered the difference between rum and proof spirit of any importance.

Mr. A. H. Mason, said that the paper which had been read was one of peculiar value, as he did not think that in any previous investigations the large number of four thousand experiments had been made to prove the case. Regarding the samples upon which Mr. Conroy based his remarks, he would like to know if Mr. Conroy had tested the filtrate from the clarified samples in order to ascertain the amount of citricity left behind. It occurred to him that the idea of the essential oil of the limes having a tendency to preserve the juice, owing to its emulsification, was a very ingenious one, and was no doubt correct.

Mr. A. H. Samuel wanted to know whether Mr. Conroy had tested samples of lime juice other than Montserrat, as he thought it would be interesting to know how the citricity compared with the samples Mr. Conroy had spoken of. There was such an extraordinary difference of opinion among the different authorities as to citricity that he thought the observations of Mr. Conroy would be very valuable, as they formed a standard which would satisfy everybody as to the relative values of lime juice which was used in the merchant shipping service or otherwise.

Mr. Conroy, in reply, thanked the meeting for the very kind manner in which his paper had been received, and also for the vote of thanks which had been passed. In reference to the remarks of Dr. Symes, he said that he had only seen limes that were grown in Montserrat, and the description he had given was chiefly obtained from Risso and Poiteau's excellent work. The tables supplied were taken from analyses made in both summer and winter, and in his opinion the citricity did not vary much with the seasons, provided the fruit was collected at the proper time and not allowed to become too ripe. He had read Dr. Symes's paper on the preservation of lemon juice, but was of opinion that the therapeutic value of the juice was injured by the application of heat. Although agreeing

with Dr. Symes that the nature of food supplied to sailors was of very great importance, it must not be forgotten that in the late British Polar expedition every attention was given to this point; still, because the lime juice was neglected, scurvy broke out to a most serious extent. In reply to Mr. A. C. Abraham, Mr. Conroy said that no special precautions were taken in filling the bottles, and they were not quite full. The Board of Trade only demanded that palatable spirit should be used, and though rum was generally used, any other spirit would be allowed, if good. Replying to Mr. Mason, he found that the filtration did not affect the citricity at the time, and in reference to Mr. Samuel's query, Mr. Conroy said that he had examined many other kinds of lime juice, but found that although the best of them ran very close in respect to citricity to the Montserrat juice, they were inferior in quality, and frequently contained salt and other impurities. He did not think that salt or salt water was always fraudulently added, but was of opinion that its presence was often due to the use of sea water in washing casks and other vessels.

The vote of thanks having been passed, the proceedings terminated.

MIDLAND COUNTIES CHEMISTS' ASSOCIATION.

The twelfth annual soirée in connection with this Association took place in the Town Hall, on Monday evening last, and was very largely attended. On the present occasion, the scientific exhibition which has usually formed a feature of these réunions, was dispensed with. The hall, however, was very tastefully decorated with mirrors, curtains, and various kinds of furniture for the recesses beneath the great gallery and orchestra, and floral decorations in the shape of plants, evergreens, palms, etc. The proceedings commenced at eight o'clock with a promenade concert. Dancing commenced at nine o'clock.

NOTTINGHAM AND NOTTS CHEMISTS' ASSOCIATION.

The annual dinner of the above Association was held on Wednesday evening last, at the George Hotel, when upwards of sixty chemists and druggists and their friends sat down.

The chair was occupied by the President (Mr. Councillor Fitzhugh), and the vice-chair by the Vice-President (Mr. Robert Jackson).

Amongst the visitors present were Mr. Councillor Lees and Mr. Councillor Gibson, of Manchester. The latter, in proposing the toast of the evening, viz., "Success to the Nottingham and Notts Chemists' Association," referred in eulogistic terms to the manner in which it was carried on, and expressed approval of the principles upon which it was founded. The Honorary Secretary (Mr. C. W. Warriner) briefly responded.

The other toasts given were "The Pharmaceutical Society," by Mr. Parker, responded to by Mr. Fitzhugh (Local Secretary); "The Town and Trade of Nottingham," by Mr. C. W. Bolton, responded to by Mr. I. H. Haywood; "The Officers and Council," by Mr. Beilby, responded to by the Vice-President; "The Visitors," by the President, responded to by Mr. Councillor Lees and Mr. George; "The Chairman," "Vice-Chairman," and "The Ladies."

Mr. Holgate again introduced to the notice of those present the claims of the Pharmaceutical Benevolent Fund, when the sum of five guineas was collected in the room.

During the evening the meeting was enlivened by songs and duets by Messrs. Castings, Pickerill, C. Taylor, and T. Selby, Mr. W. T. Cockrem ably acting as accompanyist. Donations were also announced from Messrs. Storey, Witty and Co., Oldfield, Pattinson and Co., Mr. Gibson, Mr. Mason, and Mr. Osbourne.

LEICESTER CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

On Wednesday, January 17, a lecture was delivered at the rooms of the above, No. 4, Halford Street, by Mr. J. Garrett on "Mercury" (analytical). The subject was well handled; the tests for the mercuric salts first, and those for the mercurous salts were brought before the audience in an instructive and interesting light, Mr. Garrett thoroughly working out the subject before be brought his lecture to a close.

Mr. E. Brien proposed and Mr. Vultz seconded a vote of thanks, which was heartily accorded to the lecturer.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

A meeting of this Society was held on Thursday, January 18, Dr. Gilbert, President, in the chair.

The President announced that the following distinguished chemists would be proposed for election, at the next meeting of the Society, as Foreign Members:—Beilstein, Cléve, Debray, Erlenmeyer, Fittig, Helmholtz, Mendeljeff, Lothar Meyer, Victor Meyer. A ballot for the election of ordinary Fellows will also be held at the next meeting (February 1).

The following certificates were read for the first time: A. C. Abraham, E. Bevan, C. N. Betts, F. J. Cox, A. Collenette, S. Dyson, W. T. Elliott, H. B. Fulton, C. G. Greenfell, B. F. Halford, D. Hooper, W. D. Hogg, H. F. Lowe, T. H. Leeming, J. E. Marsh, W. Newton, C. Rumble, F. Scudder, F. Watts, C. S. S. Webster.

Dr. Roscoe then communicated the substance of a paper entitled—

The Fluorine Compounds of Uranium. By A. Smithells.—Since the preparation of uranium oxyfluoride by Berzelius the above compounds have been investigated by Carrington Bolton, and more recently by Ditte; as the results obtained by these two chemists do not agree, the present experiments were undertaken to clear up the question. The green uranoso-uranic oxide U_3O_8, when acted upon by aqueous hydrofluoric acid, gives a voluminous green powder and a clear bright yellow solution. According to Bolton this green powder is UF_4, whilst the yellow solution furnishes on evaporation UO_2F_2. Ditte assigns to the green powder the formula UO_2F_2, and to the substance in the yellow solution the composition UF_6+8HF; he also represents the reaction thus: $U_3O_8+18HF=2(UF_62HF)+UO_2F_2+6H_2O+H_2$. The author endeavoured to collect the 2·6 litres of hydrogen which should be, according to Ditte, evolved from 100 grams of U_3O_8, but found that none came off. He finds that Ditte is also in error as regards the composition of the other bodies, which are, as Bolton stated, UF_4 and UO_2F_2 respectively. When UF_4 is heated in a closed crucible a white sublimate is formed; if, after five minutes, the crucible is allowed to cool, and the sublimate removed, a fresh sublimate is again formed on reheating, and so on until a residue is left of UO_2. This sublimate is isomeric with the body found in the yellow solution, and is called, therefore, a uranium oxyfluoride UO_2F_2. The author has also investigated the new fluorine compounds obtained by Ditte by fusing U_3O_8 with an alkaline fluoride, and which, he stated, had the composition UO_2F_24MF and $UOF_44MF+xH_2O$. The author concludes that these compounds have no existence, and that really only fluoxyuranates were obtained by Ditte.

The Secretary then read a paper—

On a New Method of Estimating the Halogens in Volatile Organic Compounds. By R. F. PLIMPTON and E. E. GRAVES.—The authors introduce a weighed quantity of the liquid into the tube of a glass Bunsen burner, the tube of the Bunsen is bent into a U; over the end of the Bunsen is placed a glass trumpet-shaped tube, the other end of which is connected with a U tube filled with pieces of glass; these are moistened with pure caustic soda solutions. A second U tube, similarly charged, succeeds the first; to the second U tube is joined a small wash bottle containing nitrate of silver. A Sprengel pump is connected with the wash bottle so that the products of combustion are sucked successively through the two U tubes, and finally bubble through the nitrate of silver solution. The gas having been lighted, the liquid is expelled from the weighing tube by gentle heat. After all the liquid has been thus driven off and burnt, the soda solution is washed out and boiled with sulphurous acid to reduce any chlorates, etc.; nitric acid is added and the solution precipitated with silver nitrate. The combustion usually takes fifteen to twenty minutes. About twelve analyses are given with liquids of various boiling points, the lowest being ethyl bromide boiling at 39°, the highest acetylene bromiodide boiling at 150° The results agree well with the calculated numbers.

Mr. W. A. SHENSTONE then read a short paper—

On a Modified Liebig Condenser.—The Liebig's condenser is placed vertically; to the lower end of the inner tube is fused a short piece of somewhat smaller glass tube, the end of this smaller tube projects upwards about half an inch into the condenser. In this way an annular ledge is formed between the inner wall of the condenser and the outer wall of this smaller tube. This annular space is drained by a narrow glass tube a few inches long, which is fused into the bottom of the condenser like a T piece. This narrow glass tube slopes gently downwards, and is furnished at its extremity with a stopper. The advantages are, first, that the apparatus requires less space on the table than the ordinary condensing arrangement, and secondly, that when substances have to be digested for some time and subsequently distilled, no shifting of the apparatus is required. Thus, in the preparation of formic acid by heating oxalic acid with glycerine, the stopper is inserted in the narrow T tube, any vapour rising into the condenser is condensed, trickles down, fills the annular space, overflows, and runs down into the flask. When it is wished to distil the product the stopper is taken out and the liquid, instead of running back into the flask, drains off from the annular space down the narrow T tube into the receiver. The apparatus is made by Cetti and Co.

The Secretary then read a paper—

On two new Aluminous Mineral Species, Evigtokite and Liskeardite. By W. FLIGHT.—The first mineral comes from the cryolite bed of Greenland. The author gives its formular as $Al_2F_3 + 2\,CaF + H_2O$; it resembles chalk or kaolin in its appearance. Liskeardite is obtained, as a white crystalline mineral with a tinge of blue, from Penzance; it has the formula $3\,R_2O_3As_2O_5 + 16\,H_2OR = Al$ and Fe^{iv}.

The author has made a very minute and careful determination of the water expelled at various temperatures.

The Secretary then read a paper—

On the Volume Alteration attending the Mixture of Salt Solutions. By W. W. J. NICOL.—The author has investigated the changes of volume in mixing various proportions of sodium and potassium chlorides, of potassium nitrate and sodium chloride, of sodium nitrate and potassium chloride, and of copper sulphate and potassium sulphate. The experiments show that when two salt solutions which cannot experience double decomposition are mixed, a change of volume takes place due to the different affinity of the salts for water; that double decomposition takes place in solution, and that the volume change is an index and even a measure of this decomposition.

The Society then adjourned to February 1.

ROYAL INSTITUTION.

THE PRIMEVAL ANCESTORS OF EXISTING VEGETATION AND THEIR BEARING ON THE DOCTRINE OF EVOLUTION.

BY PROFESSOR C. W. WILLIAMSON.

The second lecture of this course was delivered on Tuesday last. The following is an abstract :—

The living Lycopods or Club-mosses consist of two groups, the Lycopodia and the Selaginella, distinguished by their spores. The former group has only one kind of spore, each of which develops a "prothallus," which bears the two sets of organs corresponding to the pollen-grains and ovules of the flowering plants. This is the chief form occurring in cold and temperate regions. The latter group has two kinds of spores, viz., microspores, corresponding to the pollen-grain and the macrospore to the ovule of the higher plants. The group of the Selaginella chiefly abounds in the Tropical and warmer regions. Both groups have virtually the same structure, with the exception of the spores. The stem, which always branches dichotomously, consists of a mass of cellular tissue, in the centre of which is either a single bundle of vessels or there are several such bundles arranged side by side. In both cases, these bundles constitute a vascular axis enclosed within a true bark. On comparing the structure of one of those macrospores of Selaginella with that of the seed of a Coniferous plant we discover several definite features in which they agree so closely as to render a transition from the one to the other no difficult thing for Nature to accomplish. These recent forms are all of dwarf dimensions, and mostly of creeping habit. Though they are very abundant, and widely diffused over the globe at the present time, it is singular that they are very rare in a fossil state. One small form has been detected in Arctic beds of Tertiary age, and one or two that we have reason for regarding as of the same type are met with in the Oolitic beds of Yorkshire. Still finer examples have been discovered in rocks of Carboniferous age, in the coal-beds of the Franco-German frontier, near Saarbrucken, showing that their rarity in the oolites and yet newer beds was not due in all probability to their non-existence, but to their non-preservation, since it can scarcely be doubted that the carboniferous types have been connected with the living ones by a continuous line of descent. When we reach the Permian rocks, following the descending order, we meet for the first time with some of the magnificent arborescent genera so characteristic of the Palæozoic ages, and which evidently attained their grandest development during the Carboniferous epoch. During this age they constituted various vast forests, abounding in trees from 50 to 100 feet in height, with stems having a bulk corresponding to the mass of foliage which they had to support. Though there are several genera of these arborescent Lycopods, they are chiefly resolvable into two—the Lepidodendra and Sigillaria.

The Lepidodendron had a stem covered with the large leaf-scars which marked the former positions of the leaves on the young branches, but which had been much enlarged by the growth of the stem and branches. These scars are arranged in diagonal lines that wind equally right and left round the stem. The leaves, which were more or less elongated and narrowly linear, adhered long to the branches. The latter exhibited invariably the dichotomous subdivisions still so characteristic of the small living species. On turning to their internal organization we find how widely these stems and branches of the fossil forms differ from the recent ones. The youngest twigs of the former approached very closely in structure to that of the stems of the latter. They possessed a single small bundle of vessels enclosed in a thick bark. But very soon advancing growth developed this bundle into a cylindrical ring of vessels enclosing a small cellular pith, thus dividing the stem into a pith, a vascular zone which sent branches to the leaves, and a thick bark, to the

exterior of which the leaves were attached by a pulvinus, or thickened base. As the stem or branch grew the vascular ring increased both in size and in the number of its component vessels, the pith growing in the same time and ratio. But after reaching a certain stage of growth, which stage was reached sooner or later in the case of various species, an altogether different structure was added to their stems and branches. The vessels of the existing ring were grouped irregularly and in no definite order. By the process of vegetable growth known as "exogenous," a new vascular cylinder was added to the exterior of the pre-existing one; its vessels were now arranged in regular radiating lines, and separated by cellular medullary rays, and additions seem to have been made to the outer border of these radiating laminæ, as long as the life of the plant endured. This new cylinder differed very little in any essential respect from those similarly produced in the Oaks and Elms of our own time.

French observers, followers of Brongniart, regard the growth of this second cylinder as a distinctive feature characteristic of the next plant to be noticed—the Sigillaria. This idea is altogether contradicted by innumerable facts revealed by our British discoveries. The only real difference between the Lepidodendron and the Sigillaria is seen in the exterior of the bark. In the former, as we have seen, the leaves are arranged on the branches in diagonal spiral lines; in Sigillaria they are arranged in vertical lines. All other supposed internal distinctions are merely due to differences of age. Sigillaria, like Lepidodendron, is an arborescent Lycopod.

Both these genera had the same kind of root. This was once believed to be a distinct plant, known by the name of Stigmaria Ficoides. These roots were, like the stems, of huge dimensions. Like the aerial branches, they branched dichotomously, and were clothed with large cylindrical rootlets, the organization of which bespoke clearly their Lycopodeaceous character. The fructifications of these trees are known to us by the name of Lepidostrobi, which were merely modified half abortive branches, at the base of each leaf of which was developed a little box (sporangium) filled with spores. Possibly some of these Lepidostrobi, like the Lycopodiums, had but one kind of spore; but a large number of them were certainly "heterosporous," *i.e.*, they possessed, like the Selaginellæ, both micro- and macro-spores; the sizes and appearance of both of which, notwithstanding the differences in the sizes of the parent plants, were almost absolutely identical in the primæval fossils and in the living plants. The peculiar branches which bore these fruits have long been known under the name of Haloniæ, and various functions have been attributed to them. It is now certain that they were the fruit-bearing, ultimate branches of some Lepidodendra, and probably of Sigillaria also. The stems, also, known as Ulodendra, are merely these branches from which the Lepidostrobi have fallen, leaving impressed upon the surface of the bark circular scars corresponding to the bases of the fallen fruits, but which, like initials cut long ago on the bark of some tempting Elm, have grown with the growth of the stem on which they were inscribed. That a large number of the fallen cone-like organs shed both microspores and macrospores is shown by the numbers of these two structures which both swell the bulk and improve the qualities of the Coals of which they form so important a part.

The plants just described reappear in the yet older Devonian rocks, but here they are associated with yet more anomalous and archaic forms, especially with the well-marked genus Psilophyton, so abundant in the Devonian strata of Canada. It appears to be Lycopodendrous, though widely removed from all living types. There is further evidence that some of these Palæozoic types were living in the age of the upper Silurians. Fragments have been found sustaining that conclusion.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of this Association was held on Thursday, January 18, Mr. H. G. Greenish, Vice-President, in the chair.

Mr. F. Ransom read a paper on the "Detection of Strontium," which will be published in a future number of this Journal. A discussion followed, in which the Chairman, Secretary, and Messrs. Dymond and Haward took part. A vote of thanks was passed to Mr. Ransom.

Mr. Elborne then read a "Report on New Remedies," which will probably be published in a future number. The report was illustrated by specimens.

A discussion on the subject of the Report took place, in which the Chairman, Secretary, Messrs. Cripps, Haward and Ransom took part.

The Secretary then announced that the Executive Committee had appointed Mr. R. A. Cripps to be the Reporter on Practical Pharmacy for the ensuing session. The meeting then adjourned.

Parliamentary and Law Proceedings.

Poisoning by Chloral.

On Saturday, January 20, Dr. Diplock held a long inquiry at 29, Upper Phillimore Place, Kensington, as to the death of Mrs. Catharine Gape, the widow of Admiral Gape, aged 36.

Annie Godwin, cook in the service of Dr. Heffenden, said she was requested to go home with the deceased on Tuesday night. The deceased at that time complained of the death of a favourite dog. When they arrived home the deceased went up to her bedroom. Witness followed, and saw her put a chloral bottle on the mantelshelf, at the same time saying, "Oh, God, I'm dying!" Witness answered, "Nonsense, Mrs. Gape." The deceased, who appeared in very low spirits, added, "I have taken fourteen doses."

Dr. Heffenden said he had attended the deceased for some years. On Tuesday night he was sent for, and everything was done to restore the heart's action, but to no effect. Witness had never prescribed chloral for her.

The Coroner informed the jury that the chloral in the bottle was known as "Hunter's Solution of Chloral."

Annie Godwin, upon being recalled, said that the gas in the bedroom was barely alight when Mrs. Gape drank from the bottle.

After a lengthened deliberation the Jury returned a verdict, "That the deceased died from the effects of chloral, and that the said death was accidental." At the request of the Jury the Coroner added the following rider, and promised to forward it to the Home Secretary: "We are of opinion that some restrictions should be placed upon the sale of patent medicines that may be used as poisons."—*Daily News.*

The West Malling Poisoning Case.

At West Malling, on Wednesday, Mr. J. Rogers, one of the coroners for Kent, resumed his inquiry into the circumstances attending the death of Sarah Ann Wright, the daughter of a labourer residing at Malling, who, on December 14, last, died as alleged, from the administration to her by the Rev. J. H. Timins, the vicar of the parish, of a teaspoonful of oil of bitter almonds.

Dr. Pound added to his evidence that he did not agree with various theories advanced by Mr. Timins in his evidence. He was of opinion that if Mr. Timins had taken a teaspoonful of the same oil as caused the death of the deceased, it must have been fatal in his case; while he also believed that if when the girl cried out on swallow-

ing the oil, or even when Mr. Timins had himself taken some of the oil, medical assistance had been called in, the girl's life would in all probability have been saved. As to the suggestion of apoplexy, when he made the *post-mortem* examination, he had in his mind the fact that death might have arisen from apoplexy, among other matters ; but he had not the slightest doubt that death was due to prussic acid poisoning, and he had no difficulty in arriving at that conclusion. He could not have made a more searching investigation.

Dr. Pope expressed the same opinion as to the necessarily fatal effects of a teaspoonful of oil such as that given to the girl. He noticed at the *post-mortem* examination an enlargement of the thyroid gland, but there was nothing in that likely to cause death. He was in the house after the girl had taken the oil, and the mother told him Mr. Timins had given her something which made her cry, but this did not make him suspect anything. In hastily passing through the room and cursorily glancing at the deceased he saw nothing in her condition which would lead him to think she was approaching her end.

The Coroner, in summing up the evidence to the jury, said that the result of a *post-mortem* examination of the body of the deceased had been the discovery of prussic acid and of oil of bitter almonds. Such being the case he thought that, notwithstanding the statement by Mr. Timins at the last meeting, death was due to prussic acid poisoning, and not to natural causes. It was for the jury to consider whether or not Mr. Timins was criminally responsible for the administration of the poison, it having been suggested that he was not and that the death was due to misadventure. Mr. Timins had stated that he was originally a student of medicine at St. Thomas's Hospital, but that was some thirty-six years ago, and he never qualified. Since then the science of medicine had developed new theories and practice, so that what might then have been considered proper might now be obsolete. Mr. Timins too, had since been engaged in a very different profession. In order to enable a non-professional man to administer with safety in a case of emergency it was laid down by Lord Lyndhurst in Rex *v.* Webb, that it was necessary it should be at a place where proper medical assistance could not be secured. In this case no one could say that there was a question of emergency, and there were also two or three medical gentlemen resident in the place. That being the case, and death having been caused by the administration of oil of almonds by Mr. Timins, it would be for the jury to say whether or not he was criminally responsible. When the oil was purchased Mr. Timins said it was to be used externally, and they knew that the girl had been induced to drink it, although she did so with some reluctance. Mr. Timins had stated that he also took a dose, but he had admitted that he knew that the oil of bitter almonds contained a certain quantity of prussic acid. He had further stated that he mistook the poisonous for the non-poisonous oil on this occasion: but after he gave it to the girl he did not do what was unquestionably his duty —send immediately for a doctor. For it was fair to assume that the poor girl's life might have been saved if he had done so.

The Jury, after some consultation, returned a verdict of manslaughter against the Rev. J. H. Timins. At the same time they expressed their belief that the oil of almonds was administered with no evil intent.—*Times.*

G. Brown.—If you refer to the *Lancet* for the 13th inst., you will see that a correction was inserted on p. 88.

"*Dispenser.*"—(1) You have omitted to give a copy of the prescription. (2) "Nut oil," expressed from the seeds of *Arachis hypogœa.*

W. C. M.—You must follow the usual procedure for gas analysis.

Devonia.—A ten volume solution will answer. See *Pharm. Journ.* for March 11, 1882, p. 747.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Permanganate of Potash Pills.

Sir,—I always held the Scotchman in profound veneration for his transcendant abilities; but after reading Mr. Mackenzie's letter of Saturday last, I was completely dumb, and held my breath in silent admiration of the Celtic soul of Mr. Mackenzie's elder apprentice in particular. The Saturday previous I felt very grateful to Mr. Martindale for his formula for a pill that had given me considerable trouble, now I am quite vexed with him for giving me so much trouble. Why, sir, we have been "fooling around" (as the Americans say) with cacao butter, vaseline, kaolin, and all sorts of things, when we have at hand a nice clean and simple medium on our dispensing counter. Really, Mr. Martindale, you might have known better, and not given us all this trouble for nothing; but now comes the question, How did he do it? One chemist I know tried it (before Mr. Mackenzie's letter). Result: Chemist with a burnt finger, and a charred mass in the mortar, accompanied by a display of fireworks on a small scale. Perhaps for the benefit of these poor ignorant men Mr. Mackenzie himself (not his elder apprentice) will kindly mix the mass, and then tell us how much permanganate remains in each pill; the result will, I think, astonish him.

I was asked fourteen days ago to prepare these pills and use conf. rosæ, and on my suggesting this was worse than useless, was left to find out the best excipient. My resort was cacao butter. This was subsequently verified by an appeal to Dr. Ringer. Cacao butter does certainly make a very nice pill, but is very difficult to make. If the molten mass could be poured into a small mould it would then be perfection.

Mr. Martindale's plan is by far the most practicable one I have come across yet (except, of course, that of Mr. Mackenzie's elder apprentice), the only danger being you are apt to get the pills rather large. This, of course, is avoided with a little practice.

Manchester. J. Hart.

Sir,—If the senior apprentice at 45, Forest Road, Edinburgh, had been experimenting in spontaneous combustion I can easily understand that he would use sugar and syrup to make up pills of permanganate potash. Let him try again and he will see the result and find the mass burnt up in less than three minutes. For my own part, I prefer to adopt the course followed by that cunning artificer in pharmacy, Mr. Martindale, of New Cavendish Street.

Norwich. Octavius Corder.

Sir,—I should not recommend any one to adopt Mr. Mackenzie's method of making permanganate of potash into pills with the aid of sugar.

Apart from the reducing action of sugar on such a substance as permanganate of potash, pills so made are liable to take fire should the pestle be used a little firmly.

Edinensis.

Sir,—I am sure the trade must feel deeply indebted to Mr. Mackenzie (and his intelligent senior apprentice) for publishing his formula for making the above pills.

I tried it and found that the mass "went off" in the mortar in a similar manner as with glycerine (mentioned by Mr. Martindale) only less violently.

I made excellent pills by using to 20 grains of the salt, 4 grains ung. resinæ and 1 grain p. gum. trag.

Chester. F. B.

Communications, Letters, etc., have been received from Dr. Dowse, Dr. Hesse, Dr. Thresh, Messrs. Cowdery, Macnaught Bros., O'Sullivan, Wright, Hutton, Robinson, W. C. M., R. J.

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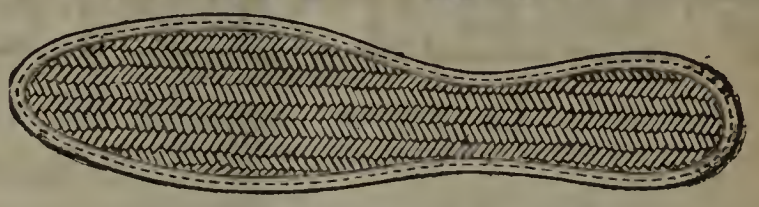

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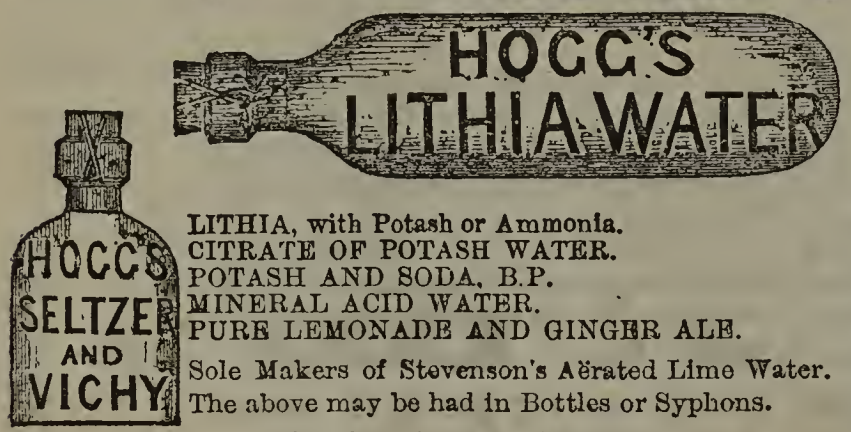

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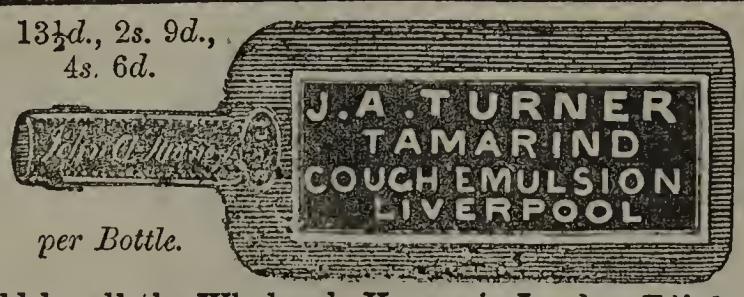

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The Pharmaceutical Journal AND Transactions.

THIRD SERIES, No. 658.] SATURDAY [illegible]RUARY 3, 1883. [PRICE FOURPENCE.

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Pharmaceutical Society of Great Britain,

17, BLOOMSBURY SQUARE, LONDON.
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EVENING MEETING.

The next EVENING MEETING will be held on Wednesday, February 7th, 1883, at Eight o'clock.

The Chair will be taken at half-past Eight *precisely*.

The following papers will be read:—

"A Research on the Alkaloid Gelsemine and some of its Crystalline Salts." By A. W. GERRARD, F.C.S.

"Aromatic Spirit of Ammonia." By Dr. THRESH.

"An Apparatus for Continuous Extraction." By WYNDHAM R. DUNSTAN and F. W. SHORT.

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The Board of Examiners for England and Wales meets at 17, Bloomsbury Square, London, in February, April, June, July, October, and December, and the Board of Examiners for Scotland meets at 119A, George Street, Edinburgh, in January, April, July, and October, for the purpose of conducting the above Examinations. Candidates must give notice to the Registrar in London, and pay the fee on or before the *first* day of the month in which the Examinations are held. Each candidate for the Major and Minor Examinations must, at the time of giving notice, produce a Registrar's Certificate of Birth, and a certified declaration that for three years he has been registered and employed as an Apprentice or Student, or has otherwise for three years been practically engaged in the translating and dispensing of prescriptions. Printed forms of declaration may be obtained from the Registrar in London. Each Candidate for the Modified Examination must state the number of the receipt for his declaration and his age at the time of giving notice.

Candidates will receive notice of the date on wh ch they will be required to present themselves.

Special Notice to Advertisers.—See page iii.

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FOR 1883.

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Copies will be supplied by the Registrar, 17, Bloomsbury Square, London, W.C.

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N.B.—An Index to the Advertisements, for the purpose of facilitating reference, will be given.

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On Thursday, Friday, and Saturday Mornings, at 9 o'clock.

PRACTICAL CHEMISTRY .....Professor ATTFIELD.
Daily at 10 o'clock, in the Laboratory.

RE-COMMENCEMENT OF LECTURE COURSES.

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Will re-commence on Monday, March 5th, 1883.

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1. An exposition of the physical forces involved in chemical and pharmaceutical operations and changes.

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3. The chemistry of organic compounds, with a description of such as have important applications in the arts and in medicine.

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Instruction in Practical Dispensing will be provided for those Students who have previously had but slight means afforded them of becoming skilled in such operations.

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3. Systematic and Practical Botany, which is taught during the summer months in the Royal Botanic Society's Gardens, Regent's Park.

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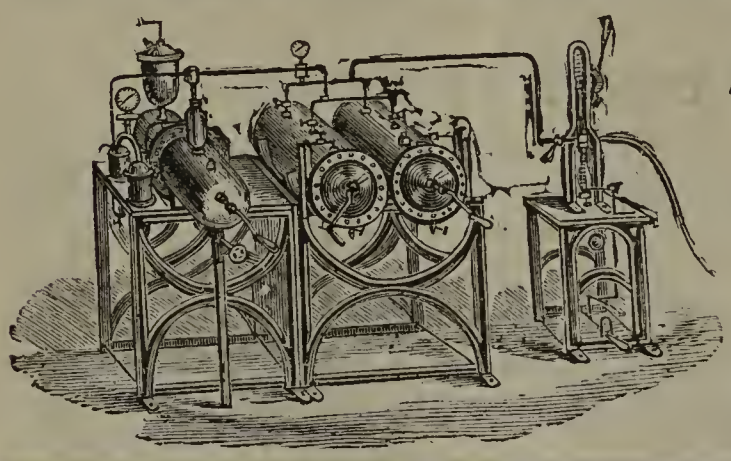

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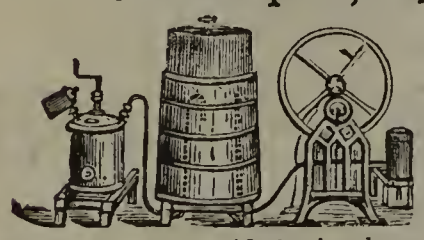

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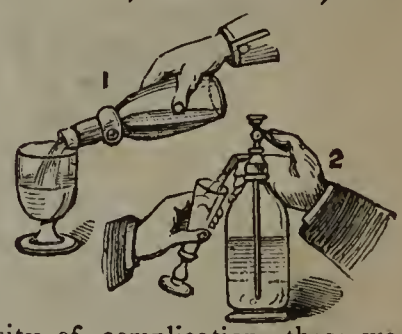


All our Machines have a Gasometer, and it forms a most important necessity where purity of product is required, as in this the gas is expanded and purified; it also removes the possibility of accidents by explosion, and avoids the necessity of complication—these we consider of greater importance than the saving of a few inches of floor space. *Our valuable Book of Recipes and Instructions accompanies every Machine, and the most unskilled can at once produce Waters of the highest class.*

Sole Agents for Codd's Patent Bottle, Fig. 1. Sole Manufacturers of the "London-Made" Syphon, Fig. 2.

PATENTEES OF THE IMPROVED CORKING MACHINE FOR CHAMPAGNE BOTTLES. ILLUSTRATED CATALOGUE FORWARDED FREE.

SPECIAL NOTICE.

MUMFORD'S
PURE
CRUSHED LINSEED
IS NOW REDUCED TO

PER **19/-** CWT.

(In smaller quantity, 20/- cwt.)

"NOTHING FINER CAN BE OBTAINED."

NO OIL EXTRACTED.

STEAM MILLS, FARRINGDON ROAD, E.C.

UMNEY'S

Lancet.—"An excellent preparation; contains all the alkaloids of the Bark."
Medical Times and Gazette.—"An excellent, elegant, reliable and very convenient preparation."
Pharmaceutical Journal.—"Excellent preparation, furnishing the constituents of the Bark in a concentrated form."
Chemist and Druggist.—"Pharmaceutically worthy of the valuable medicine which it represents."
Medical Press and Circular.—"Used in hospital and private practice with the most satisfactory results."

At Medical International Congress, London, the Indian Bark was declared to be the Bark of the future.

Extensively used in private and Hospital practice, on account of its ELEGANCE, MEDICINAL VALUE, and MODERATE COST.

FLUID EXTRACT OF CINCHONA.

Made from Bark of Cinchona Succirubra, as grown in Government Plantations of British India.

See opinions of Medical and Pharmaceutical Press, and testimony as to its superiority over all other Fluid Preparations of Cinchona.

Price 10/6 per lb.

To be obtained of all Druggists (Wholesale and Retail) in the United Kingdom.
In ordering, specify "UMNEY'S."

WRIGHT, LAYMAN & UMNEY,
SOUTHWARK, LONDON, S.E.

GREAT REDUCTION IN PRICE.

LIEBIG'S EXTRACT OF MEAT

ASK FOR **RAMORNIE** BRAND.
Australian Meat Co.
9 & 11, Fenchurch Avenue, LONDON, E.C.

7-lb. Tins ...	per lb. 5/11	... each	41/5
1-lb. Jars ...	,, 6/2	per doz.	74/-
½-lb. ,, ...	,, 6/4	... ,,	38/-
4-oz. ,, ...	,, 6/7	... ,,	19/9
2-oz. ,, ...	,, 7/-	... ,,	10/6
1-oz. ,, ...	,, 7/8	... ,,	5/9

NOTE PRICE!!!

We pay Carriage on Extract Orders if amounting to 10 lbs. weight or over. Packages free.

CHINOQUININE.

The entire precipitated and bleached crystallizable alkaloids of East Indian Red Bark (*Cinchona succirubra*), containing Quinine, Cinchonidine, and Cinchonine in the form of *Muriates*. In appearance, medicinal properties, and mode of administration it closely resembles Quinine; it may be given in all cases where the pure alkaloid is required, whilst, as a tonic, and in cases where Quinine alone is objectionable, its use is especially advantageous.

In 1 oz. bottles, price 5s. 6d.; 4 oz. bottles, 5s. 3d. per oz.; and in 25 oz. tins, 5s. per oz.

FERRI ET CHINOQUINÆ CITRAS.

A "Scale preparation," containing 25 per cent. of Citrate of Chinoquinine. Dose and medicinal properties are same as Ferri et Quinæ Cit., P. B. In 1 oz. bottles, price 1s. 9d.

LIQUOR FERRI ET CHINOQUINÆ CITRAS.

An elegant preparation of the above in a liquid and very palatable form; prepared for convenience in Dispensing. Each fluid drachm contains 10 grains of Citrate of Iron and Chinoquinine. Price 6s. per lb.

"Pharmacist" Microscope, £4 4s. net; Materia Medica Cabinets, £2 2s. to £4 4s.; Chemical Sets (Minor), 15s; (Major), 25s.

WYLEYS & CO. { WHOLESALE AND EXPORT DRUGGISTS AND MANUFACTURING PHARMACEUTISTS, } **COVENTRY,**

And WYLEYS, WALKER & CO., 223, UPPER THAMES ST., LONDON.

Æsculap

A POSITIVE CURE FOR STOMACH, LIVER & KIDNEY AFFECTIONS.

The Only Palatable Natural Aperient Water.

THE BEST HOUSEHOLD REMEDY & SPECIFIC FOR CONSTIPATION

Highest Award at the International Medical Exhibition, 1881. Retail 1/6 & 2/- per Bottle.

A SUPPLY OF CIRCULARS WITH NAME AT FOOT AND DESCRIPTIVE PAMPHLETS FREE ON APPLICATION.

Chemists can safely stock this Water, as it will continue to be well advertised.
It is prescribed by all the leading Medical Men.

ÆSCULAP BITTER WATER COMPANY, Limited, 38, Snow Hill, LONDON, E.C.

FRY'S MALTED COCOA AND FRY'S MALTED CHOCOLATE

Are combinations of FRY'S PURE COCOA EXTRACT and CHOCOLATE PASTE with ALLEN & HANBURYS' CONCENTRATED EXTRACT of MALT, affording delicious beverages. The Extract may be most agreeably taken in either of these forms. Sold in tins at 1s. and 2s. each, 9s. and 18s. per dozen. The COCOA is in the form of Powder, the CHOCOLATE of PASTE, and sweetened.

Lancet, December 18th, 1880:—"This is an excellent preparation of Cocoa and Malt Extract. It is dried at a gentle heat, to avoid injury to the diastase; its dietetic and digestive value is beyond all dispute, and it is very agreeable in flavour."

See also—*British Medical Journal*, Nov. 13th, 1880; *Medical Times & Gazette*, Jan. 1st, 1881; *Medical Press*, Jan. 26th, 1881.

To be had of the Manufacturers, all Wholesale Houses, or from

ALLEN & HANBURYS, Plough Court, Lombard Street, London.

DR. J. COLLIS BROWNE'S
CHLORODYNE
THE ORIGINAL AND ONLY GENUINE.

IMPORTANT CAUTIONS

From Lord Chancellor SELBORNE, Vice-Chancellor Sir W. PAGE WOOD, and the LORDS JUSTICES of APPEAL.

VICE-CHANCELLOR SIR W. PAGE WOOD, by whom the suit in Chancery was first heard, stated, in his judgment, that "Dr. J. Collis Browne was undoubtedly the Inventor of Chlorodyne, that the whole story of the Defendant Freeman was as deliberately untrue as the falsehood he had deposed to with reference to the use of his Chlorodyne in the Hospital."

THE VICE-CHANCELLOR also stated, "that Chlorodyne was a fanciful name, and had application been made sooner, the Court would have given Dr. Browne protection."

LORD CHANCELLOR SELBORNE coincided with the judgment of the Vice-Chancellor upon this point, and stated "that had application been made at a proper time and place, the Court would have found means to restrain the Defendant from misrepresenting the decision of the Vice-Chancellor."

LORD JUSTICE JAMES on appeal stated, in his judgment, "that the Defendant Freeman had made a deliberate misrepresentation of the decision of Vice-Chancellor Wood."

It was proved in Court, on affidavit by Mrs. Forbes, of Paris, that the testimonial published in the *Times*, November 14th, 1865, speaking of the great efficacy of Chlorodyne in Cholera referred to Dr. J. Collis Browne's Chlorodyne, and that she never used any other, that she had written to the Defendant Freeman to that effect, notwithstanding which notice the Defendant publishes the said testimonial as referring to his medicine.

The Editor of the *Medical Times*, in his report on Chlorodyne, January 13th, 1866, gives information that the Chlorodyne referred to was the medicine introduced by a retired Army Medical Officer, which was Dr J. Collis Browne, still this is published by the Defendant as testimony to his medicine.

Numerous affidavits from eminent Physicians and others were produced in Court, stating that Dr. J. Collis Browne was the inventor of Chlorodyne, and that when prescribing they mean no other.

The Defendant himself publishes that his compound is in effect and composition quite different to any other preparation, nevertheless he assumes the name, testimonials, &c., of Chlorodyne.

Technicalities in law prevent that protection which the public should justly have against such a course of conduct. It is now incumbent on all who purchase Chlorodyne to see that the name, "Dr. J. Collis Browne's Chlorodyne," is engraved on the Government Stamp, as it is not sold otherwise. All other compounds under the name of Chlorodyne are spurious. All attempts at analysis have failed, hence the statement that the constituents of Chlorodyne are known is a misrepresentation.

FURTHER IMPORTANT NOTICE.

From SYMES & Co., Pharmaceutical Chemists, Medical Hall, Simla.—*January* 5, 1880.

To J. T. DAVENPORT, Esq., 33, Great Russell Street, Bloomsbury, London.

DEAR SIR,—Have the goodness to furnish us with your best quotations for Dr. J. COLLIS BROWNE'S Chlorodyne, as, being large buyers, we would much prefer doing business with you direct than through the wholesale houses. We embrace this opportunity of congratulating you upon the wide-spread reputation this justly-esteemed medicine has earned for itself, not only in Hindostan, but all over the East. As a remedy of general utility we much question whether a better is imported into the country, and we shall be glad to hear of its finding a place in every Anglo-Indian home. The other brands, we are happy to say, are now relegated to the native bazaars, and, judging from their sale, we fancy their sojourn there will be but evanescent. We could multiply instances, *ad infinitum*, of the extraordinary efficacy of Dr. COLLIS BROWNE'S Chlorodyne in Diarrhœa and Dysentery, Spasms, Cramp, Neuralgia, the Vomiting of Pregnancy, and as a general sedative, that have occurred under our personal observation during many years. In Choleraic Diarrhœa, and even in the more terrible forms of Cholera itself, we have witnessed its surprisingly controlling power. We have never used any other form of this medicine than COLLIS BROWNE'S, from a firm conviction that it is decidedly the best, and also from a sense of duty we owe to the profession and the public, as we are of opinion that the substitution of any other than COLLIS BROWNE'S is a deliberate breach of faith on the part of the chemist, to prescriber and patient alike.

We are, Sir, faithfully yours,
SYMES & CO.,
Members of the Pharmaceutical Society of Great Britain,
His Excellency the Viceroy's Chemists.

After these public statements in a Court of Equity, and subsequent confirmation by the trade at large, no Chemist can conscientiously use or sell any other compound for Chlorodyne, without committing a breach of faith unjust to patient and physician. The value of the remedy *alone* creates the great demand.

Sold in Bottles—1*s.* 1½*d.*, 2*s.* 9*d.*, 4*s.* 6*d.*, and 11*s.* Usual Discount to the Profession.

SOLE MANUFACTURER,

J. T. DAVENPORT, Pharmaceutist,

33, GREAT RUSSELL STREET, BLOOMSBURY SQUARE, LONDON.

SAVORY & MOORE'S
LIQUID EXTRACTS OF THE DIGESTIVE FERMENTS.

"Most powerful preparations in the form of mother liquors," of pleasant odour and taste.

PANCREATINE, Neutral Essence of.

A perfectly tasteless preparation, specially adapted for the peptonisation of milk, arrowroot, and other mucilaginous articles of diet in general use in the sick room.
Dose, 1 drachm.

PANCREATINE, Saline Essence of.

The most powerful agent for the digestion of Fat and Farinaceous Foods.

PEPSINE, Saline Essence of.

The most powerful agent for the digestion of Meat, Milk, Eggs, &c.
May be taken with Food as a Sauce or Ketchup.

These preparations are reliable and concentrated forms adapted for all the purposes for which Pancreatine and Pepsine are administered. Dose, 1 drachm. (See *British Medical Journal*, Dec. 13, 1879, p. 965, &c.)

PEPSINE ELIXIR
(Acid Glycerole of Pepsine).

A convenient solution for admixture with other remedies, as Iron, Bismuth, &c., its syrupy nature rendering it easily miscible with other syrups and aqueous fluids.
Dose, 1 drachm.

These Preparations are obtainable in 4, 8 and 16 oz. Bottles, or any quantity required, of all Wholesale and Retail Chemists, &c.

NUTRITIVE, OR MIXED PEPTONE ENEMA
(ENEMA PEPTONICUM, SAVORY),

Consisting of mixed Peptonised Foods for injection per Rectum, thus supplementing and relieving the Digestive Organs. Prepared at the suggestion of A. E. SANSOM, Esq., M.D., &c.

SAVORY & MOORE,
143, NEW BOND STREET, LONDON, W.

GALE & CO. LONDON,
WHOLESALE DRUGGISTS,
Manufacturers of Chemicals and all Pharmaceutical Preparations.

Chemical Analysis of every description promptly conducted.

Export orders for India, China, and the Colonies promptly executed.

SPECIAL TERMS FOR QUANTITIES.

A LIBERAL DISCOUNT FOR CASH.

Ext. Coto. Liq. 2oz. = 1oz. of Bark.
From clinical experiments performed in the General Hospital at Munich, Prof. GIETL concludes that we have in this drug a specific against diarrhœa in its most diverse modifications. Dose, 3 to 5 m. 12*s.* lb.

Opiatine (GALE'S). *Registered.*
The safest and most reliable preparation of Opium, neither causing headache nor constipation. Dose, 10 to 30 m. 8*s.* lb.

Mist. Bismuthi Aromat. (GALE'S).
Generally approved as a valuable Tonic, Stomachic, and Anti-dyspeptic. Dose, ½ to 1 dr. 4*s.* lb.

Ess. Secalis Volatilis (GALE'S).
Originated by us over 50 years ago. Much approved and relied upon. Dose, 30 to 50 m. 6*s.* 8*d.* lb.

ESTABLISHED UPWARDS OF THREE QUARTERS OF A CENTURY.
Gale & Co. TRADE MARK. DREADNOUGHT REGISTERED LONDON

Tinct. Quebracho.
Much used for the relief of Dyspnœa. Dose, 1 dr. 4*s.* 6*d.* lb.

Liquor Cinchonæ (GALE'S).
1 oz. contains all the Alkaloids of 1 oz. of East Indian Bark. Dose, 15 to 30 m. 10*s.* lb.

Tinct. Phosphori (GALE'S).
The safest, most reliable, and efficacious preparation of Phosphorus. *Vide* BRITISH MEDICAL JOURNAL, April, 1877. 8*s.* lb.

Tinct. Alstoniæ (GALE'S).
(ALSTONIA CONSTRICTA—QUEENSLAND FEVER BARK).
This remedy has almost replaced Quinine in Queensland, in the treatment of Ague and Fevers, and as a general tonic in debility after exhausting diseases.
It is free from many of the disadvantages peculiar to Quinine, and is especially useful in those cases where that drug cannot be taken. Dose, ½ to 2 dr. 4*s.* lb.

Cod Liver Oil Emulsion (GALE'S).
Free from Gums and Alkalies which derange the stomach. Agreeable, easily assimilated. 3*s.* 6*d.* bottle.

Dreadnought Hospital Plaster.
(*Registered*).
Pliable, Adhesive, Antiseptic, Non-irritating. 3 yard rolls, 4*s.*

GALE & CO., 15, BOUVERIE ST., FLEET STREET, E.C.

Priced Catalogue and Formulæ of Pearl Coated Pills, with Notes on New Remedies, on application.

Squire's (Parrish's) Chemical Food. [*Syrup. Ferri. Phosph. Comp.* (*Squire*).] P. & P. W. SQUIRE, who have for many years been the SOLE AGENTS, have purchased the right of and all particulars relating to the manufacture of PARRISH'S CHEMICAL FOOD, as prepared by the late Mr. EDWARD PARRISH, of Philadelphia.

This tonic has stood the test of time, having been more largely prescribed for the last 20 years than any other preparation of the kind. It is most peculiarly suited for delicate children, not only from its bone-forming properties and agreeable taste, but also from the fact of its containing no poisonous ingredient to interfere with its prolonged administration.

(In 4-oz., 8-oz., and 16-oz. bottles.) To distinguish this preparation orders should be written "SQUIRE'S CHEMICAL FOOD."

Confection of Fresh Bael Fruit. A valuable Remedy in Chronic Diarrhœa and Dysentery. Dose—A Teaspoonful. Prepared in this country from Bael Fruits imported ripe and fresh in their natural state.

"It possesses all the aroma of the fruit, and, when prepared with ripe fruit, is not only astringent when diarrhœa exists, but possesses the singular property of being aperient if the bowels be irregular or costive."

"Messrs. Squire's preparation is all that can be wished."—*The Lancet*, July 24, 1880. (In ½-lb. and 1-lb. Pots.)

Dialysed Iron. [*Liquor Ferri Dialysatus* (*Squire*).] A neutral and tasteless solution of Iron. (In 1*s.* 6*d.* and 2*s.* 6*d.* Boxes, with Pipette.)

Euonymin. (GREEN in Colour.) Prepared from the YOUNG Bark. A powerful hepatic stimulant. Dose—2 Grains.

Tincture of Euonymin. Dose—30 Minims.

Iridin. Dose—4 Grains made into a pill and taken at bedtime is a certain remedy for biliousness. *Vide* Professor Rutherford's experiments, *British Medical Journal*, February 8, 1879. The Euonymin and Iridin used in these experiments were supplied by Messrs. Squire.

Pepsine (Squire). Dose—2 to 5 Grains. A NEW CONCENTRATED Pepsine prepared in Paris expressly for P. & P. W. SQUIRE. It is almost without taste and smell, and keeps well. (In ½-oz. and 1-oz. Bottles.)

Solution of Bimeconate of Morphia. [*Liq. Morph. Bimec.* (*Squire*).] Introduced in 1839. This solution is prepared direct from Opium, by which means the salt is obtained in its natural state. It possesses the sedative properties of Opium without the unpleasant after effects.

New Syrup of Senna. A good aperient for children, and has a very pleasant taste. (In 4-oz. and 8-oz. Bottles.)

Extract: Gummi Rubri Liquidum. Dose—30 to 60 Minims. Prepared from very carefully selected soluble gum of the Eucalyptus Rostrata (Astringent Gum Tree of Australia). A powerful astringent for internal and external use. (In 4-oz. and 8-oz. Bottles.)

Red Gum Lozenges made from the same gum as above are particularly useful in relaxed sore throat. (In Bottles, 2*s.* each.)

Muriate of Ammonia Lozenges. A pleasant and useful lozenge for a cough or bronchitis. (In Bottles, 2*s.* each.)

Extract: Cannabis Indicæ. Prepared from Indian Hemp specially selected for and imported by P. & P. W. SQUIRE.

Improved Inhalation Respirator, for continuous antiseptic inhalation, as described in Dr. BURNEY YEO'S Lecture in *British Medical Journal*. (Price 6*d.* and 1*s.*)

Various Antiseptic Solutions to use with above Respirator.

Liquor Ferri Hypophosph: Co. Dose—15 to 60 Minims.
Vinum Ferri Hypophosph: Co. Dose—A teaspoonful diluted.
Prepared from the Formula of Dr. F. CHURCHILL.

Extract Fuci Vesiculosi Liquid (Bladder-wrack). Dose—A teaspoonful given for Obesity. It also diminishes glandular swellings in scrofulous cases.

Extract of Malt. A PURE concentrated extract prepared from malt. Dose—One teaspoonful.

Distilled Extract of Witch-Hazel (Ext. Hamamelis Virgin. Destil.). A colourless preparation. For internal and external use. Dose—30 Minims. In 2-oz. and 4-oz. Bottles. A valuable remedy for Piles.

Tinctura Colchici Florum. Prepared from the fresh flowers. Dose—10 to 30 Minims. This preparation is considered by some to be the most effective of the liquid preparations of Colchicum.

Extract: Vincæ Major: Liquid. Dose—1 to 2 Drachms. For arresting menorrhagic and other hæmorrhages.

Glycerol: Plumbi Subacetatis. (Same strength as Liquor Plumbi Subacet.) Useful as an application in some cases of eczema.

Homburg Salt. (The natural salt of the Elizabeth Spring, Bad Homburg.) Useful in Dyspepsia, Habitual Constipation, and in preventing attacks of gout. (Sole agents for this country, P. & P. W. Squire. (In 2*s.* 6*d.* and 3*s.* 6*d.* Bottles.)

Liq. Ferri Chloroxydi. A solution in water of a basic Chloride of Iron. The solution contains about the same quantity of Iron as Liquor Ferri Perchloridi, but much less Chlorine. Exception has been taken to Dialysed Iron, because it has been deprived of the acid; this preparation may be considered as a medium between Liquor Ferri Perchloridi and Dialysed Iron.

Linim. Belladonnæ Co. This preparation, sprinkled on impermeable piline, and firmly applied to the painful part, will give instant relief in many cases of rheumatism, lumbago, and neuralgia. (In 1-oz., 2-oz., and 4-oz. Bottles.)

Phosphorus Pills. 1-30th or 1-50th Grain. These Pills are readily soluble in the stomach, and are coated in such a manner that they do not lose the phosphorus by keeping.

Liquor Ergotæ Ammoniata. The dose is the same as the fluid extract of the Pharmacopœia. The process adopted in the manufacture ensures a complete exhaustion of the active principles of the drug.

Odourless Antiseptic Ointment in collapsible tubes. These tubes can be carried in the waistcoat pocket, and are invaluable to accoucheurs and others who require to make examinations. The ointment does not become rancid by keeping.

SQUIRE, Chemist on the Establishment in ordinary to the Queen, Chemist in ordinary to H.R.H. the Prince of Wales, **413, OXFORD ST., LONDON.**
CORNER OF DUKE STREET, GROSVENOR SQUARE, W.

NEW GOODS.

Special Notice to the Trade.

We beg to notify that the proprietors of Lundborg's Perfumes have appointed us their Sole European Agents.

The LUNDBORG'S PERFUMES have gained such popular favour in other countries, that we anticipate for them an equal appreciation in the United Kingdom by people of refinement and good taste.

In America these goods occupy pre-eminently the first rank for quality above any foreign perfumes.

OTHER ODOURS.

MARÈCHAL NIEL ROSE { 2oz. Bottles, 33/- per Dozen.
EDENIA ... ... 1oz. " 21/- "
FASCINATION ... ... 1oz. "

Each of these names are secured by Trade Mark, and imitators or any one selling imitations will be prosecuted.

1oz. Bottles, 21/- per Dozen.

For Delicacy, Richness, and Permanency, Lundborg's Extracts certainly have no equal.

The rare excellence of quality, combined with the elegant and tasteful style in which they are put up, renders them at once attractive and readily saleable.

As novelties in this market, the trade will, we believe, be glad to introduce them, as they yield a good profit, and do credit to the introducer.

THE ENTERPRISE DRUG MILL.

Constructed on an improved principle, the cutters being easily removable for inspection, or for cleaning. It may be regulated to grind to any degree of fineness or coarseness, by simply turning a single thumbscrew. It is adapted to almost any dry pulverizable substance ; it works rapidly and is economical.

Professor MAISCH, one of the highest American authorities on pharmacy, says that "It is the best drug mill that has yet been devised. It is intended to displace the use of the mortar for general purposes in pulverizing drugs."

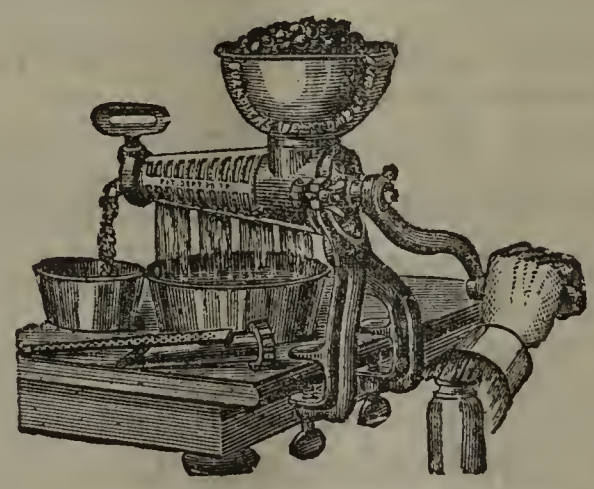
Prices { **Plain** .. 40s., 60s., 100s. / **Ornamented** 50s., 70s., 110s. } **each.**

THE

ENTERPRISE TINCTURE PRESS.

Specially adapted for Coarse and Fibrous Drugs.

The principle upon which the Press operates is, that the drug is acted upon in a continuous thin layer which is forced forward by each revolution of the screw into smaller and smaller space, the leverage yielding a force so powerful as to extract almost the entire moisture, delivering the residue of suitable drugs with almost crisp dryness, and, as experience has shown, it saves a greater amount of Tincture (very important in the case of Tincture of Opium and other expensive drugs) than even the most powerful Hydraulic Press. So thorough is its action in this



respect that the *Chemists' Journal* has humourously remarked of it that "it will almost squeeze blood out of a turnip." One firm informs us that they have saved at least £20 more in three months, by the use of this Press, than they could secure by using any other. The working of this Press being continuous, either small or very large quantities may be operated upon at one time, and much more rapidly than in any other form of apparatus.

The fact that drugs require handling but once, that the use of press cloths is done away with, and that the operation is continuous, shows a great advantage in this Press over any other.

BURROUGHS, WELLCOME & Co., Manufacturing Chemists, 7, Snow Hill, London, E.C.

THE NEW PHARMACOPŒIAS FOR THE UNITED STATES AND GERMANY.

(*Continued from page* 583.)

Catechu, U.S.P. and P.G.—The U.S.P. still gives the preference to the extract of *Areca Catechu*, and the P.G. to that of *Uncaria Gambir* and *Areca Catechu*. The test that it should show a crystalline structure when examined in glycerine under a lens magnifying two hundred times cannot apply to the areca catechu, since Flückiger and Hanbury were unable to obtain crystals from it.

Catechu should not leave more than 15 per cent. of insoluble residue when treated with spirit or boiling water, nor yield more than 6 per cent. of ash.

Caulophyllum, U.S.P.—The rhizome and roots are official. This new addition is valued as a uterine tonic by the Eclectics,* but is regarded by Stillé and Maisch as "probably destitute of medicinal power" ('Dispensatory,' p. 373).

Cera Flava, U.S.P. and P.G.—The P.G. requires that beeswax shall be soluble in 300 parts of boiling alcohol, sp. gr. 0·830, with the exception of a very small brownish-yellow residue. Upon the cooling of such a solution a white crystalline paste is precipitated, and when the pale yellowish liquor has been filtered it should not be rendered turbid by water, neither should it more that slightly redden blue litmus paper. One part of wax digested for an hour with 300 parts of spirit, sp. gr. 0·96, and 1 part of caustic soda added, should give a clear liquid which, when cooled and filtered, is not precipitated by hydrochloric acid.

According to the U.S.P. cera flava should be soluble in 35 parts of ether and 11 of chloroform. Soap is detected by hydrochloric acid giving a precipitate in water in which the wax has been boiled, and paraffin is recognized by being left insoluble when 5 grams of wax are heated for fifteen minutes with 25 grams of sulphuric acid to 160° C., and the mixture subsequently diluted with water. For the detection of vegetable wax, resin, etc., a test similar to that of the P.G. is given, except that an aqueous instead of a spirituous alkaline solution is ordered.

Cetaceum, U.S.P. and P.G.—The P.G. has raised the melting point from 45°–50° in the last edition, to 50°–54° in the present one. One part of cetaceum should be soluble in 40 parts of boiling alcohol and water should precipitate nothing from the liquid filtered when cold.

Chelidonium, U.S.P.—It is difficult to understand the admission of this drug to the materia medica, more particularly since sanguinaria, which is said to possess the same active principle is retained. Chelidonium is, however, a favourite medicine with homœopaths, and is valued as a domestic remedy in the United States.

Chenopodium, U.S.P.—Chenopodium anthelminticum is made a variety of *C. ambrosioides*, L., and a description is now added.

Chondrus, U.S.P.—*Chondrus mammilosus*, Grev., U.S., is now official as well as *Chondrus crispus*, Lyngb., but the description given does not apply to the latter, which differs in having pedicellate fruit and a channelled stem to the frond. The latter plant is now generally referred to as *Gigartina* and the specific name spelt mammillosa.

Chirata, U.S.P.—Not only is the name altered from "Chiretta," but the name of the plant yielding it, which is now *Ophelia Chirata*, Griesb. No mention is made of the presence or absence of pith in the stem, nor of the relative thickness of its woody portion by which the much less bitter *Ophelia angustifolia* is distinguished from *A. Chirata* (*Pharm. Journ.*, [3], v., p. 481).

Chrysarobinum, U.S.P. and P.G.—The U.S.P. apparently intends a mixture of the chrysarobin of Liebermann and Seidler (*Pharm. Journ.*, [3], ix., 896) and chrysophanic acid, such as is usually met with in commerce under the name of chrysophanic acid, since it describes chrysarobin as "a mixture of proximate principles (commonly named chrysophanic acid)," and gives the test that sulphuric acid dissolves chrysarobin with a deep blood-red colour which does not apply, according to the above-named chemists, unless chrysophanic acid is present in it.

In the P.G., on the other hand, in which the tests given by Liebermann and Seidler to distinguish the two bodies are not adopted, chrysophanic acid would seem to be excluded, since it is required that the water in which chrysarobin has been boiled (1 part in 2000) should not give an acid reaction, nor be coloured by solution of sesquichloride of iron, and if shaken with liquor ammoniæ, should take one day to assume a purplish-red (coccineum) colour. Yet from the statement in the P.G. that chrysarobin dissolves in sulphuric acid, forming a solution of a colour from pale red to yellow, it would appear that allowance is made for traces of chrysophanic acid, since pure chrysarobin, according Liebermann and Seidler, dissolves in that liquid with a yellow colour. The P.G. directs that whenever chrysophanic acid is ordered for external use chrysarobin is to be dispensed, but gives no directions for its use in case the chrysophanic acid is intended for internal administration.

Cimicifuga, U.S.P.—The size of the rhizome as regards diameter (1 inch) is certainly larger than is generally met with in English commerce, $\frac{1}{2}$ to $\frac{3}{4}$ inch being the usual width. The description of the internal structure, "a smooth fracture with a large pith," is scarcely definite enough, since the central portion is as firm and resinous as the bark and is not at all like ordinary pith.

Cinchona, U.S.P.; Cortex Chinæ, P.G.—"Cinchona," including "the bark of any species of cinchona containing at least 3 per cent. of its peculiar alkaloids," is official for the preparation of the infusion. No definition is given of the alkaloids intended by the word "peculiar," so that a bark containing cinchonine and cinchonidine, but no quinine, may be used provided the total yield of alkaloids amount to 3 per cent. In the U.S.P., under cinchona flava, *C. Calisaya* is still official for the preparation of the extract, fluid extract and tinctura cinchonæ; and under cinchona rubra, *C. succirubra* is ordered to be used in the preparation of tinct. cinchonæ co. The description of calisaya bark is not sufficiently definite to enable any one to detect the substitution of flat pieces of *C. Peruviana, nitida, australis*, or of *C. scrobiculata* in quills, for the official bark. The statement that the quills of *C. Calisaya* bark are "marked by longitudinal and transverse fissures *about one inch apart*," is not correct. *C. Calisaya* in flat pieces

* *Pharm. Journ.*, [2], iv., p. 52.

and *C. succirubra* in the same state containing the required percentage of the alkaloid rarely enter into retail commerce, and the Pharmacopœia, therefore, might well have omitted bark of this kind.

In the P.G. only the bark of the cultivated species, "especially *C. succirubra*," is official; only a brief description of the bark is given, and it applies more to *C. succirubra* than to any other species. The bark is required to contain alkaloids to the extent of 3½ per cent. and the presence of those proper to cinchona is determined by heating 0·1 gram of the powdered bark in a glass tube, when it should give a purplish-red tar; and that quinine is present is ascertained by the chlorine and ammonia test.

Cinnamomum, U.S.P.; Cortex Cinnamomi, P.G.—The U.S.P. permits the use of both Ceylon cinnamon and Chinese cinnamon (cassia bark); the latter is defined as the bark of one or more undetermined species of *Cinnamomum* grown in China. In the P.G. the barks afforded by species of *Cinnamomum* growing in Southern China now are alone official, exception being taken to such as are mucilaginous. This exception appears to be intended to exclude the bark known in the London market as cassia vera, and which occasionally arrives in large quantities.

It may be hoped that in a future British Pharmacopœia the mistake will not be made of permitting the indiscriminate use of two barks so distinct in flavour as those of *C. zeylanicum* and *C. Cassia*, under one name. The result must of necessity place dispensers of medicine in an awkward position. A patient who has had medicine containing tinct. cinnamomi, U.S.P., made up with tincture of the Ceylon species in one shop, and subsequently at another shop in which tincture of the Chinese drug had been used, would infallibly consider the difference in taste to imply that some error had occurred in dispensing the medicine.

Since chemists are allowed choice in the matter, the fact that the cassia bark is cheaper and that it is the only official kind in the P.G. will, it may be hoped, lead to uniformity in the use of that bark, and so prevent much annoyance both to dispenser and patient. In the next British Pharmacopœia there need be no difficulty in defining the botanical source of cassia bark (*Pharm. Journ.*, [3], xiii., p. 583.

Coccus, U.S.P.—No insoluble powder should separate when the insect is macerated in water, indicating absence of sulphate of barium, etc.

Colchici Radix, U.S.P.—Colchicum root which is of a dark colour internally and which breaks with a horny fracture should be rejected.

Colocynthis, U.S.P.; Fructus Colocynthidis, P.G.—The U.S.P. now adds a description which allows of the use of any commercial variety, except that of Mogador, and compels the use of recently dried mature fruits, by remarking that the seeds are brown. The P.G. omits any description of size and now gives the maximum dose as 0·3 gram.

Conium, U.S.P.—The fruit only is now official, and the division of the umbelliferæ to which it belongs is now mentioned. The plant is no longer represented in the P.G., coniine having been omitted.

Cornus, U.S.P.—The bark of the root is now alone official.

Creasotum, U.S.P.—The tests given in the U.S.P. seem to point to German beechwood creasote as the kind which is official, since it is stated that if 1 volume of creasote be mixed with 1 of glycerine a nearly clear mixture will result, from which the creasote will be separated by the addition of one or more volumes of water (*Pharm. Journ.*, [3], ii., 921; Watts' 'Dictionary of Chemistry,' viii., 580). Its boiling point should be 200° C., and most of it should distil over between 205° and 220° C. It should be soluble in 80 parts of water at 150° C. to a somewhat turbid liquid and in 12 parts of boiling water. It should not coagulate albumen or collodion. Besides the solvents mentioned in the B.P., chloroform, benzol, and disulphide of carbon are given.

Crocus, U.S.P., P.G.—The U.S.P. remarks that "saffron should not be mixed with the yellow styles." This must surely be a misprint for stamens, any unusual length of style being quite an exception, while stamens are present in the majority of samples, being much more easily extracted from the flower than the whole length of the style. It should not deposit any pulverulent matter when soaked in water. The P.G. gives a colour test as follows:—1 part of saffron macerated with 10 parts of water should give a liquor which will give a yellow colour to 10,000 parts of water. This test would probably lead to the discovery of the use of any artificial colouring matter insoluble in water, such as the dinitrocresylate of sodium, which has been used to impregnate marigold petals mixed with saffron (*Pharm. Centralh.*, December 28, 1882, p. 619). Saffron should not give more than 8 per cent. of ash on incineration, 5 to 6 being the usual amount according to 'Pharmacographia.' The percentage of moisture that saffron should normally contain is not mentioned in the U.S.P., although the presence or absence would make a considerable difference in the quantity used in making the tincture; in the P.G. it is estimated at less than 14 per cent.

Cubeba, U.S.P.; Cubebæ, P.G.—According to the U.S.P. cubebs should not be mixed with the nearly inodorous rachis or stalks, these are often present in considerable quantity. The remark that the fruit "is internally whitish and hollow" is, to say the least, an inadequate description. The P.G. also orders the removal of the *peduncle* of the fruits.

Cypripedium, U.S.P.—Now removed from the secondary list and a description added. The fluid extract is the only official preparation. This drug is sometimes confounded with valerian, being known to herbalists as American valerian, and being used for the same diseases as that drug. The difference between the two official species, *C. pubescens* and *C. parviflorum*, has been pointed out by Maisch (*Amer. Jour. Phar.*, 1872, p. 297).

Digitalis, U.S.P.; Folia Digitalis, P.G.—The U.S.P. now gives a description in which it is stated that the midrib is broad near the base, a feature which distinguishes it from the other leaves usually mixed with it, except primrose leaves. From these, however, the acute angle of the lateral veins and their decurrence into the petiole in digitalis leaves would serve as distinguishing characters. The P.G. directs that the leaves of wild plants should be used. The simple, not felted, character of the tomentum is also pointed out as distinctive. The leaves are to be collected when the plant is in flower. The U.S.P. does not give any time of collection, but only requires that the leaves should be collected from plants of the second year's growth. In view of the

fact of the varying strength of preparations of digitalis, greater uniformity might probably be obtained either by following the example of the P.G., or by ordering the fresh leaves only to be used, or to be gathered when the plant is in flower, and by omitting the infusion. The maximum dose of the leaves is given as 0·2 gram.

(*To be continued.*)

BACTERIA IN THE SOIL AND THE AIR.

In the laboratory at Montsouris a series of observations has for some years been conducted on the bacterial germs present in the atmosphere and the soil, with especial reference to their relation to the spread of infectious diseases. Experiments were also made on the cultivation of bacteria in artificially prepared nutrient fluids.

The quantity of bacterial germs in the air varies with the time of year, with subordinate temporary fluctuations. It is also largely dependent on the weather, rain clearing the air to a large extent of the germs. While rain is actually falling the number of germs in the air is greatly reduced; it increases as the ground dries, and again diminishes when the drought has lasted for ten or fifteen days.

The following are the artificial nutrient fluids chiefly employed, with the means used for sterilizing them, and the degree to which they are then susceptible to the attacks of bacteria:—

Fluid.	Mode of sterilizing.	Degree of susceptibility.
Cohn's nutrient fluid.	Heat of 100° C.	0·05
White of egg . . .	Pasteur's gypsum filter, cold.	0·22
Normal urine . . .	Pasteur's gypsum filter, cold.	0·40
Normal urine . . .	Heat of 110°.	0·50
Neutralized urine .	Gypsum filter, cold.	0·90
Neutralized bouillon.	Heat of 110°.	1·00
Normal urine, diluted	Gypsum filter, cold.	1·80
Serum of blood, diluted	Gypsum filter, cold.	6·00
Juice of strawberry and grape . . .	Gypsum filter, cold.	9·50
Juice of cabbage, diluted	Gypsum filter, cold.	10·90
Juice of calf's flesh .	Gypsum filter, cold.	13·50

The kind of bacteria varied with the different fluids; but in the two years there was found an average of from 65 to 79 per cent. of micrococcus, 14 to 24 per cent. bacillus, and 7 to 8 per cent. bacterium. In the fluids obtained from plants the bacterium amounted to about one-third.

Experiments made at the same time and in the same way in Paris (at the Mairie of the 4th Arrondissement), showed a very much larger quantity of bacterial germs in the air. The following are the numbers from October, 1880, to September, 1881:—

	Paris.	Montsouris.
October	920	142
November	750	106
December	540	49
January	470	45
February	330	31
March	750	74
April	970	48
May	1000	80
June	1540	92
July	1400	190
August	960	111
September	990	105

With some variations, curves formed for the two places would nearly agree, the average at Paris being about ten times that at Montsouris. More exact curves, made for weekly periods, showed a still closer coincidence in the increase and decrease at the two places. The proportion of different forms was 93 per cent. micrococcus, 5 per cent. bacillus, 2 per cent. bacterium. Ammoniacal or urine ferments were also found in the air, and are probably a fruitful cause of infectious diseases. Pierre Miquel distinguishes three kinds of urine-ferments:—*Micrococcus ureæ*, *Bacillus ureæ* and *Torula ureæ*.

The number of bacterial germs found in the air of hospitals was enormous, amounting in the Hotel-Dieu to 5600 per cubic metre in the summer months. The following are the numbers for different months:—

	Men's ward.	Women's ward.	In the city of Paris.
March, 1881 . .	11,000	10,700	750
April	10,000	10,200	970
May	10,000	11,400	1000
June	4,500	5,700	1540
July	5,800	7,000	1400
August	5,540	6,600	960
September . . .	10,560	8,400	990
October	12,400	12,700	1070
November . . .	15,000	15,600	870

The diminution in the summer months Miquel attributes entirely to the better ventilation. The presence of hospitals in large towns he believes to be a most prolific cause of infectious diseases, such as small-pox, scarlet fever, diphtheritis, erysipelas, typhus, etc.

A very interesting comparison is drawn between the presence of bacteria in the air and the prevalence of infectious complaints. The weekly bacterial curves of Paris and the weekly curves of mortality published in the 'Bulletin de Statistique Municipale,' under the authority of M. Bertillon, show an almost complete agreement.

Another series of observations was devoted to the bacteria present in the soil. A gram of earth at the Observatory at Montsouris contained 750,000 germs; in the Rue de Rennes, 1,300,000; in the Rue Monge, 2,100,000.

THE BEHAVIOUR OF DISULPHIDE OF CARBON TOWARDS PERMANGANATE OF POTASSIUM.*

Some time ago, E. Allary proposed to purify disulphide of carbon by shaking it with an aqueous solution of permanganate of potassium, and subsequent washing. This announcement induced Eugene Obach, who had previously used this method without success, to study the behaviour of the two substances upon each other, under varying circumstances. We give an abstract of his results in the following:—

1. *Behaviour of permanganate of potassium towards pure disulphide of carbon.*

a. Pure disulphide of carbon, when shaken and left in contact with the solid permanganate, remains entirely unaffected.

b. If pure water be poured upon the pure disulphide, and solution of permanganate be dropped into it, until the water has a rose-red tint, on shaking the tint passes to onion red in a few minutes. If a little more permanganate is added, the same thing happens. And if the water be separated, the disulphide washed with water and then again covered with fresh water, a new addition of permanganate will again show a reduction. After the treatment has been repeated four times, the reduction takes place very slowly.

If light is excluded from these manipulations, the reduction is greatly retarded.

c. If the previous operations are repeated with water containing a small amount of sulphuric acid, the reduction takes place comparatively more rapidly. Naturally, the result is not an onion-red colour, but perfect colourlessness.

* From *Journ. f. pract. Chem.* Reprinted from *New Remedies*, January, 1883.

d. It was noticed that the longer the water had been allowed to remain in contact with the disulphide, the more energetic was the reduction. Two experiments were made under otherwise identical conditions. In one of them the permanganate was added immediately after the water had been added, and the results corresponded with what has been described above. In the other experiment, the water was left in contact with the disulphide for fifteen hours, and, on opening the flask, a distinct odour of sulphydric acid was perceptible, which was confirmed by the reaction with lead paper. This odour entirely disappeared after the treatment with permanganate.

e. As it was suspected that contact with water developed sulphydric acid even from pure disulphide of carbon, three flasks were partly filled, respectively, one with the pure disulphide, the other with pure water, and the third with a mixture of the sulphide and water. In each of the flasks was suspended a strip of lead-paper. After one hour, the strip in the third flask showed traces of the formation of the disulphide, after four hours it was brown, and later it turned completely black. The other strips remained uncoloured, although, after *very long* standing, there was perceptible a faint trace of discloration in the strip over the pure disulphide, undoubtedly owing to the presence of water in the paper, which had been moistened with solution of acetate of lead.

f. After every treatment of pure disulphide with permanganate, the disulphide was tested for free sulphur by means of metallic mercury, and the water was tested for sulphuric acid by means of chloride of barium. Sulphuric acid was always found present; free sulphur was sometimes found developed in the disulphide.

The occurrence of free sulphur was found to be dependent on the fact whether sulphydric acid was present, already formed in the disulphide while standing under water, or whether it was freshly given off from the water on the addition of permanganate. In the former case, free sulphur could be detected, but not in the latter. In fact, any disulphide of carbon, which originally has been quite free from free sulphur, may develop the latter either by the decomposition of any sulphydric acid contained in it by permanganate, or even by exposing the disulphide for a comparatively short time under water, to sunlight.

g. Commercial disulphide of carbon contains various impurities which may be—

Solid, chiefly consisting of free sulphur.

Liquid, fetid, sulphurated oils belonging to the allyl series (like oil of garlic, mustard, etc.).

Gaseous, also mostly fetid, among them chiefly sulphydric acid.

h. Neither solid permanganate nor its solution can remove free sulphur or the sulphurated oils; but it quickly and completely removes any sulphydric acid.

PURIFICATION OF COMMERCIAL DISULPHIDE OF CARBON.*

In the course of the paper, from which the preceding article is abstracted, E. Obach gives his method for purifying commercial disulphide of carbon. This method is mainly suitable for purifying smaller quantities for use in laboratories, and may not be quite applicable on a large scale, since it is somewhat circumstantial. But it will always furnish a pure product, unless very abnormal impurities should be present.

The crude liquid is first separated from any water which may be present, freed, by means of a dry filter, from mechanical impurities, and at once filtered into a capacious flask, in which a few pieces of burnt lime are contained. The liquid is next distilled from a water-bath heated to 70°–80° C. until only a small residue remains, which contains nearly all the free sulphur and a portion of the fetid oils. The distillate, in most cases, contains sulphydric acid, caused by the decomposing action of the lime upon some of the foreign sulphur compounds; besides, some fetid oils and a trifle of free sulphur. It is now shaken with coarsely powdered permanganate of potassium (about 5 gm. per litre), and left in contact therewith for some time, *until the sulphydric acid is removed.* The liquid poured off from the permanganate contains still some of the sulphurated oils, and a little *more* sulphur than before the treatment with permanganate. It is now briskly shaken, in a stoppered flask, with a small quantity (a few c.c. per litre) of pure mercury, *until all free sulphur is combined*; next, 25 gm. of mercuric sulphate (per litre of disulphide) are added, and the whole mixture again shaken. The reason of this mode of manipulation is this, that the mercuric salt acts more rapidly and easily upon the sulphurated oils, if the free sulphur has previously been removed. A still better way is to pour off the disulphide from the metallic mercury before treating it with the salt. The odour will indicate when *all the fetid sulphurated oils have been removed.* The disulphide is now poured off from the salt into a flask containing some pieces of porous chloride of calcium, and distilled immediately into the bottle in which the pure product is intended to be kept. The bottle must be perfectly dry, and provided with a well-ground stopper. During the last operation, day-light should be excluded. A very good way is to keep the disulphide in bottles (say of about five-pint capacity) which are themselves kept in tin boxes, blackened internally. On pouring out a little of the liquid, only the lid of the box is removed, and light can strike only a small portion of the liquid.

It is particularly to be observed that the above described processes must be performed in the precise order mentioned, since each successive manipulation is intended not only to remove an impurity already present in the disulphide, but, at the same time, also the impurity produced by the previous reagent.

The author fears to trust to the method of purification recommended by Friedburg,* viz., shaking with fuming nitric acid, since he suspects that the disulphide will obstinately retain at least traces of acid vapours.

Disulphide of carbon contaminated with sulphydric acid—but otherwise pure—acts with comparative rapidity upon metallic silver, mercury, and copper, *in presence of air*, with formation of the corresponding sulphides. If air is excluded, silver remains entirely unaffected, mercury is but very slightly affected, but copper is always distinctly coloured. If disulphide of carbon, containing sulphydric acid, is to be tested for free sulphur (the latter being present only in small quantity), this should be done in a perfectly filled bottle with exclusion of air. In this case, the blackening of metallic mercury does not proceed from the sulphydric acid, but from the free sulphur. Alkaline solutions of lead-salts decompose the vapour of the disulphide (and also various allyl-compounds) after a longer or shorter period with formation of sulphide of lead. Hence they cannot be employed as reagents for sulphydric acid.

* From the *Journ. f. prakt. Chem.*, 26, 299. Reprinted from *New Remedies*, January, 1883.

PYROLEINE.†

Dr. Don Jaime Arbós y Tor, Professor of Physics and Chemistry in Buenos Ayres, has published the results of some investigations on the products of the distillation of fixed oils under certain conditions, which he believes will be serviceable towards proving the identity and purity of at least some of them.

If 2 parts of glycerin are distilled with 1 part of a fixed oil, both substances undergo decomposition, the

* *Ber. d. Deutsch. Chem. Ges.*, 1875, 1616; 1876, 127.

† From *Revista Farmaceutica* (Buenos Ayres), 1882, Nos. 17–20. Reprinted from *New Remedies*, January, 1883.

glycerin losing 2 molecules of water and passes into the receiver as acroleine, forming the denser layer. The upper layer contains the *pyroleine*, an oily, limpid liquid of an acid reaction. If a little be taken up by the points of the index-finger and thumb, previously moistened with water, it imparts to them an extraordinary degree of slipperiness. It is insoluble in water and completely soluble in a little alcohol. When treated with an excess of alcohol, it becomes turbid, and precipitates an oil which is soluble in ether and in an excess of pyrolcine. The alcoholic solution of pyroleine, treated with acetate of lead, appears like an emulsionized fat.

Pyroleine from olive oil, obtained as the upper layer in the receiver by distilling together 2 parts of glycerin with 1 part of olive oil, possesses a penetrating odour, a dark blackish-brown colour by reflected light, and a deep red colour by transmitted light. On exposing it for ninety-eight hours to a temperature of 10° R. (54·5° F.), it begins to crystallize, forming a number of small grains which fuse at 13° R. (61·2° F.). After these have once been formed, the remaining liquid portion has a dark brown colour by reflected and a red colour by transmitted light. It is soluble in a small quantity of alcohol, communicating to it a reddish-yellow colour, which, on addition of an excess of alcohol, turns to straw-yellow, while the liquid itself becomes turbid, and there is deposited an intensely red oil soluble in ether and in an excess of pyroleine.

The alcoholic solution of pyroleine obtained from olive oil, when treated with ammonia, immediately turns dark-brown, and, after twenty-four hours, separates into a lower, transparent layer of a golden-red colour, and a very small supernatant layer of oil, but little coloured and turbid, remaining in this condition for forty-eight hours.

Nitric acid turns the liquid dark, and, after standing, causes a dark-brown oily layer to rise. After twenty-four hours, the lower layer is a rose-red liquid, and the upper one an oil, blackish by reflected, and deep red by transmitted light.

Treated with sulphate of copper, it forms a dirty-green precipitate and, after one hour, the supernatant liquid has a slightly green colour by reflected, and a dark rose-red colour by transmitted light.

Dr. Arbós concludes that any olive oil which yields a "pyroleine" having the above reactions is pure.

If a mixture of 20 parts of glycerin, 9 of olive oil, and 1 of oil of sesame be distilled, the mixture will be found to foam considerably, and the receiver will contain two layers, the lower one of which is glycerin unaltered, but having a yellowish tint.* The lighter portion is "pyroleine," in form of a limpid oil, insoluble in water, of an acid reaction, a dark-red colour, and a faint, inoffensive odour.

When allowed to stand at rest, at 10° R. (54·5° F.), it forms small, striated grains. The remaining liquid mass has a dark-greenish colour by reflected, and a dark-red colour by transmitted light. At 17° R. (70·2° F.), the crystals melt.

The alcoholic solution of this pyroleine, when treated with ammonia, becomes turbid, acquires a yellowish tint, and, after forty-eight hours, separates a light upper layer of a solid and yellowish oil.

Treated with nitric acid, the liquid assumes a reddish colour, gradually turning dark; on standing, a black oil rises, and, after twenty-four hours, there are two layers, a light yellowish liquid, and an oily layer of a dark cherry-red by reflected, and a scarlet colour by transmitted light.

* Dr. Arbós adds a note that an amount of 5 per cent. of oil of sesame in olive oil is sufficient to prevent the development of acroleine from glycerin during this distillation.

[It appears to us that the facts stated by Dr. Arbós need re-investigation and further confirmation. We lack the time to do so, ourselves, at present; but we would recommend the subject to some of our readers.—Ed. N. R.]

When treated with platinic chloride, it becomes turbid and, after a while, separates into two portions, the denser being golden-yellow, and the other red; after twenty-four hours, the oily layer has a greenish-red tint by reflected, and a dark-red colour by transmitted light.

Sulphate of copper produces a precipitate of a dirty-green colour; after one hour, the supernatant liquid has a dark reddish-brown tint by reflected, and a very dark colour by transmitted light.

Acetate of lead renders it very turbid, and forms with it a sort of fatty emulsion which, after twenty-four hours, becomes pasty.

If a mixture of 20 parts of glycerin, 10 of olive oil, and 1 of cotton-seed oil be distilled, the receiver will contain two layers, of which the lower one is yellowish acreoline. The mixture does not foam up during the distillation. The "pyroleine" obtained in this case is acid, has a reddish tint, and a peculiar odour, which is quite penetrating during the distillation, and irritant to the fauces.

When exposed at a temperature of 10° R. (54·5° F.), for twenty-four hours, minute crystalline grains are formed, which melt at 20° R. (77° F.). As long as the grains exist, the liquid portion has a buff colour by reflected, and a reddish-yellow colour by transmitted light.

The alcoholic solution of this pyroleine, treated with ammonia, becomes turbid and acquires a dark-brown colour, which, after twenty-four hours, becomes golden-yellow, surmounted by a very small oily layer of the same tint.

Nitric acid turns the liquid dark, and, after standing, a blackish oil separates. After twenty-four hours there will be a yellowish liquid and a layer of oil, of a clear carmine colour, by reflected, and a bright scarlet colour by transmitted light.

When treated with platinic chloride, it becomes at once turbid, then divides into two layers, the denser being golden-yellow, and the upper one dark yellowish-brown. After twenty-four hours it becomes quite limpid, and has a reddish colour by transmitted light.

Sulphate of copper forms a precipitate of a dirty-greenish colour; after one hour, the supernatant liquid has a greenish colour by reflected, and an olive-brown colour by transmitted light.

The foregoing results may be summarized in a table, as follows :—

Reactions.	Pyroleine from		
	Olive Oil.	Olive and Sesame Oil.	Olive and Cotton-seed Oil.
During distillation the mixture	Does not foam.	Foams.	Does not foam.
Odour of pyroleine	Faint.	Inoffensive.	Peculiar, penetrating, irritating the throat.
At 10° R. it crystallizes after	96 hours.	40 hours.	24 hours.
The liquid portion, by reflected light, is	Somewhat dark-brown.	Dark-greenish.	Buff-coloured.
By transmitted light	Red.	Dark-red.	Reddish-yellow.
The alcoholic solution is	Reddish-yellow.	Reddish.	Golden-yellow.
When treated with ammonia, set aside for 24 hours	Separates much oil, but slightly coloured and turbid, remaining so 48 hours.	Separates a very small quantity of solid yellowish oil after 48 hours.	Separates a very small quantity of solid yellowish oil after 48 hours.

Reactions.	Pyroleine from		
	Olive Oil.	Olive and Sesame Oil.	Olive and Cotton-seed Oil.
Nitric acid colours it	Brown.	Reddish and then blackish.	Blackish.
On standing, the supernatant oil is	Dark-brown	Black.	Black.
The liquid becomes, after 24 hours	Reddish	Light yellowish.	Yellowish.
And the supernatant oil by reflection	Blackish.	Dark cherry-red.	Bright carmine.
And by transmitted light	Deep-red.	Scarlet.	Bright scarlet.
Platinic chloride produces two layers, the denser being	Muddy-red.	Red.	Dark yellowish brown.
After 24 hours, liquid clears and, by transparent light, is	Deep-red.	Dark-red; and greenish-red by reflection.	Reddish.
Sulphate of copper leaves a supernatant liquid which is	Dark-greenish.	Bottle-green.	Greenish.
And by transmitted light	Dark buff-reddish.	Very dark reddish-brown.	Olive-brown.

NOTE ON THE DETECTION OF STRONTIUM.*

BY F. RANSOM.

The accurate separation of the three metals, barium, strontium and calcium, is not unfrequently attended with some difficulty. The usual method for their detection is framed upon the difference in solubility of their respective salts; more especially the sulphates and chromates.

It is well known that with very dilute sulphuric acid or similarly weak solution of sulphate in water, barium may be immediately and entirely separated. With strontium salts a somewhat similar result occurs, but it is necessary to stir the solution and set aside for some time. With calcium salts the difference is still more marked, the sulphate produced being to an appreciable extent soluble in water, and thus forming the readiest test for strontium after the removal of barium.

Another test solution, which is invariably used in the detection and confirmation of these metals, is that of yellow chromate of potassium. As with the sulphates just mentioned, so also the chromates formed on adding this test vary in solubility, and this gradation occurs in the same order. Barium chromate is insoluble, calcium chromate is very soluble, while strontium occupies the intermediate position. This latter case is most liable to be overlooked, and to the facts connected with it, I wish specially to refer.

On adding a solution of potassium chromate to a dilute solution of strontium nitrate, I obtained, contrary to expectation, a marked turbidity, and on applying a gentle heat this increased to a dense precipitate. To what extent of dilution and under what conditions this test is available, were the objects of the following experiments:—

A 5 per cent. solution of pure chromate of potassium was prepared and used throughout, the mixture being well shaken after each addition of this solution. The nitrate was chosen as being one of the commonest salts of strontium, and readily obtainable in a pure condition. Of this salt, aqueous solutions of definite strengths varying from 40 per cent. to ·25 per cent. were prepared. With the 10 per cent. solution an immediate precipitation of strontium chromate was obtained, and on setting aside for three hours this had so much increased as to convey a solid appearance to the whole contents of the tube. On applying heat to a similar solution immediately after admixture the same result was obtained as previously noticed after standing. On using more dilute solutions an immediate precipitate or turbidity appeared until reaching 1·25 per cent., which latter showed no indication until boiling, when precipitation again took place. Descending to still weaker solutions and applying heat distinct turbidity was obtained until reaching ·25 per cent., when only slight cloudiness was observable. A peculiarity in these most dilute liquids was that the slight precipitate formed became aggregated into circular discs adhering closely to the glass.

In order to compare these results with those obtainable by treating a calcium salt in the same manner, a 20 per cent. solution of calcium chloride was prepared, and to this was added the solution of potassium chromate. No precipitate was formed in the cold, but after boiling a slight turbidity was observed. This, however, unlike the slight precipitates with very dilute solution of strontium nitrate did not aggregate into discs, but remained diffused in the liquid.

From these results it is evident that under ordinary conditions strontium is partially precipitated as chromate from comparatively dilute solutions, and that this precipitation is largely increased by the application of heat. Calcium chromate, on the other hand, is practically not precipitable even from strong solutions and with the aid of heat.

The next question which arises is whether this comparative insolubility of strontium chromate is liable to affect its detection in the ordinary mode of analysis of metals in the fourth group, where barium is firstly removed with potassium chromate. In this case, however free acetic acid is sure to be present, having been used to dissolve the precipitated carbonates. To determine this experiments were performed similar to those already described, but acidulating the solution with acetic acid previously to adding the potassium chromate. With this alteration very different results were obtained.

A 5 per cent. solution under this treatment did not produce the least turbidity even after boiling, and even with a 20 per cent. solution no immediate effect was apparent, although considerable turbidity occurred after the application of heat. With a 40 per cent. solution distinct turbidity appeared, immediately increasing to a marked precipitate when heated.

From this it is evident that there is no danger of losing a sufficient amount of strontium to interfere with its subsequent detection in the presence of acetic acid, provided that the solution has been kept cold.

Finding that strontium chromate which was previously precipitated is now kept in solution with the acid, it might be supposed that on neutralizing this with ammonium hydrate, precipitation would again occur. The experiment was therefore repeated with the 10 per cent. solution of nitrate in presence of acetic acid, and finally ammonia added until the colour changed from orange to yellow, and the liquid was slightly alkaline. The bichromate was now reduced to neutral chromate, and the acetic acid converted into ammonium acetate. The result, however, differed materially from that obtained in the first case. Instead of a dense precipitate only a turbidity appeared, increasing to a moderate precipitate on the application of heat. Testing more dilute solutions, only a slight precipitate fell with the aid of heat from the 5 per cent., and below this no visible effect could be obtained.

* Paper read at a Meeting of the School of Pharmacy Students' Association, January 18, 1883.

From this it appears that although precipitation occurs somewhat more readily than in the presence of free acetic acid, yet the ammonium acetate which is present retains in solution the larger portion of the strontium chromate that is formed.

To briefly sum up we may therefore say—

Firstly, that strontium salts in solution may be detected by the addition of neutral chromate of potassium, and the subsequent application of heat, provided that we are dealing with a simple solution of strontium nitrate not more dilute than ·5 per cent.

Secondly, the presence of free acetic acid prevents this precipitation, especially in the cold.

Thirdly, this latter condition is not materially altered when the free acid is entirely neutralized.

Lastly, in the usual method for the detection of the three metals, barium, strontium and calcium, care must be taken to add excess of acetic acid when dissolving the carbonates, in order that free acid may be present and thus prevent the precipitation of strontium with potassium chromate.

PRECIPITATION OF STRONTIUM CHROMATE.

Strength of Solution $Sr2NO_3$.	$Sr2NO_3 + K_2CrO_4$.	$Sr2NO_3 + K_2CrO_4$ +heat.	$Sr2NO_3 + HC_2H_3O_2 + K_2CrO_4$.	$Sr2NO_3 + HC_2H_3O_2 + K_2CrO_4$ +Heat.	$Sr2NO_3 + HC_2H_3O_2 + K_2CrO_4 + NH_4HO$.	$Sr2NO_3 + HC_2H_3O_2 + K_2CrO_4 + NH_4HO$ +Heat.
40 per cent.	Solid after eight minutes.	Solid.	Turbidity.	Precipitate.	Solid.	Solid.
20 per cent.	Solid after quarter hour.	Solid.	No immediate effect.	Considerable turbidity.	Considerable precipitate.	Dense precipitate.
10 per cent.	Solid after half hour.	Solid.	No effect.	Slight turbidity.	Turbidity.	Precipitate.
5 per cent.	Immediate turbidity; nearly solid after three hours.	Solid.	No effect.	Very slight turbidity.	No effect.	Slight precipitate.
2·5 per cent.	Immediate turbidity (slight).	Dense precipitate.	No effect.	No effect.	No effect.	No immediate effect. Turbidity after standing.
1·25 per cent.	No immediate turbidity.	Precipitate.	No effect.	No effect.	No effect.	No effect.
·5 per cent.	No effect.	Turbidity aggregating into circular discs adhering to tube.	No effect.	No effect.	No effect.	No effect.
·25 per cent.	No effect.	Turbidity aggregating into discs as above.	No effect.	No effect.	No effect.	No effect.

PREPARATIONS OF ERGOT, BASED UPON THE LATEST SCIENTIFIC INVESTIGATIONS OF ITS MOST VALUABLE MEDICINAL CONSTITUTENTS.*

BY C. S. HALLBERG, CHICAGO.

Ergot of rye ranks undoubtedly among our most largely used and important remedies. Like opium and cinchona, it plays a *role* in relieving human suffering, specific in its character and not easily displaced by any other agent. But unlike these, although the history of ergot is even more ancient and in its universal occurrence is familiar even to the less well informed, our chemical and pharmaceutical knowledge of it is far behind that of these two contemporaries. So much more is this to be wondered at since, owing to its occurrence where it is encountered every day, and its occasional presence in the "staff of life" has been followed by the most serious consequences. Long after its therapeutic value was conceded its constituents were little known, very erroneous conclusions were arrived at by those to whom the credit of its first chemical investigation is due and upon these were based processes for the various pharmaceutical preparations. It is only necessary to compare the product ergotin, formulated by Bonjean and Wiggers respectively, to see the lack of uniformity in the views held by these investigators. These two processes were so radically different that the products were equally distinct in physical and therapeutic properties. The first mentioned aimed at presenting those constituents soluble in diluted alcohol *only*, as being of the most value, to the exclusion of the fixed oil, alcoholic extraction and other well recognized disturbing principles; in Wiggers' process the matter soluble in diluted alcohol, considered the most important by Bonjean, was rejected and the poisonous products claimed to represent the most valuable medicinal properties of the drug. Although ergot is largely obtained in this country, it is small in grain and cannot favourably compare with the large grain Spanish, which, though commanding a greater price, is to be preferred when it can be obtained fresh and free from worms. This ergot presents a dark pearl colour, and when of good quality should present a smooth fracture with a curved violet line; it must not be spongy or yellowish. The preservation of ergot is rather difficult, particularly of the powdered, and different means have been devised to prevent it becoming worm eaten, etc., such as heating before bottling, and addition of camphor, ether and chloroform. Hager has proposed :—

Pulvis Ergotæ Purificatus, which is prepared as follows : Ergot in coarse powder is first exhausted of its fixed oil, by means of percolation with deodorized benzin, it is then extracted with strong alcohol which displaces the benzin and takes up about 2 or 3 per cent. of a black resinous matter and the poisonous alkaloid *ergotinina*. The alcohol is recovered by distillation, and the ergot is spread out in shallow pans set in a warm place so that any remaining odour of benzin may be dissipated. The original process consists only in freeing the ergot from the fixed oil, but the subsequent percolation with alcohol is desirable, as it displaces the greater portion of the benzin, extracts the asphalt-like resin, thus rendering the ergot more readily exhausted with water, and deprives it of the poisonous principle. The purified ergot thus obtained loses from 25

* Read at the third annual meeting of the Illinois Pharmaceutical Association.—Reprinted from the *American Journal of Pharmacy*, January, 1883.

to 30 per cent. in weight, and is therefore of correspondingly greater strength than the crude drug. Unlike the ordinary powdered ergot, this article can be preserved in glass-stoppered bottles for any reasonable length of time, according to the writer's experience, owing probably to the fact that it does not contain any ergotinina to the decomposition of which the rapid spoiling of ergot is due. The coarse powder will be found very convenient for the preparation of wine, infusion, etc., and the finely pulverized can be administered in substance. The petroleum benzin used in this process is the commercial sp. gr. 716. The mode of deodorizing it is as follows: To the benzin add gradually with agitation about 3 per cent. sulphuric acid diluted with an equal quantity of water; after standing decant from the black tarry residue. Wash the benzin with water to which has been added sufficient carbonate of soda to neutralize the acid, decant and then wash repeatedly the benzin, lastly separate carefully from the water or distil. This yields a product possessing very little taste or odour, and will be found very useful in the laboratory and for domestic use.

Oil of Ergot.—The yield of fixed oil from ergot ranges from 25 to 30 per cent. It is very heavy, dark-brown in colour, almost odourless, and sometimes separates, upon standing, stellate tufts of a pearl colour supposed to be *cholesterin*. The oil yields an orange-yellow soap. It has been lately recommended for skin diseases, and the soap could possibly be used to advantage. The writer has used several hundred pounds of the oil as a *lubricator* for machinery and found it *unequalled*.

To determine if the oil contained any alkaloid, it was agitated with very little dilute sulphuric acid; the acid liquid concentrated and an excess of caustic soda added, which threw down a cinnamon-brown body. This precipitate was washed with water, in which it seemed insoluble, and citric acid added. Upon further standing well-defined crystals were formed, which were coloured orange-yellow by sulphuric acid; *but showed no precipitation with alkaloid reagents.* This substance was supposed to be *sclerocrystallin* which, according to Dragendorff, is of no medical importance.

Alcoholic Extractive.—The asphalt-like resinous mass above referred to, extracted with strong alcohol, which, according to Hager, is only fit to burn up, was examined with a view to isolate the alkaloid ergotinina. It was broken up, some soda added and extracted with ether and the ethereal liquid mixed with water, but sufficient soap was held in solution to prevent the liberation of the ether, which should contain the alkaloid, the mixture forming a thick emulsion which after long standing did not show any signs of separation. The production of this rare alkaloid was therefore temporarily abandoned and its isolation is undoubtedly coupled with great difficulties as the most thorough pharmaceutical chemist, Dragendorff, failed in it and is of the opinion it is almost impracticable. The ethereal solution previous to the addition of water left upon evaporation acicular crystals which corresponded in tests and appearance to sclerocrystallin.

Fluid Extract of Ergot.—The official process of the last pharmacopœia was based upon too general a method without any regard for the extraction of the active constituents or their preservation. The addition of acetic acid previous to the concentration of the weak percolate was unnecessary and irrational, as the active principle being itself an acid, an alkali would have been better adapted to prevent its volatilization if fugitive. The alcoholic strength of the menstruum was too great, as it extracted none of the *scleromucin* which is only soluble in alcohol of 40 per cent. and under. The glycerin and the high alcoholic percentage were favourable to the extraction of the oil and the ergotinina, which were possessed of undesirable, if not actually poisonous, properties. The menstruum adopted in the new pharmacopœia will undoubtedly be as *aqueous* as possible to insure a permanent product. Alcohol of 40 per cent. yields a very good preparation representing the drug *fairly*, but still containing more or less fixed oil and alcoholic extractive. The writer is, therefore, of the opinion that the ergot should first be freed from oil and resin, before a fluid preparation can be made from it, representing *all* the valuable medicinal constituents of the drug to the exclusion of inert matter and those principles possessed of undesirable qualities.

Fluid Ergot.—Upon the investigations of Dragendorff, Podwissotzky, Blumberg and others having been made public, new processes were adopted for preparations that would conform to these theories. The writer constructed a formula for a preparation termed fluid ergot, in contradistinction to the officinal fluid extract. As this article has proved during several years' increasing use its superiority over the ordinary fluid extract, and clinical experience sustained the views held in regard to it on theoretical grounds, the process for its preparation might be of interest. The powdered purified ergot, prepared as above, is digested with twice its weight of water at 150°F., for twenty-four hours and expressed, the residue is again macerated in warm water for twelve hours. After settling, the expressed liquids are strained and evaporated separately, when both together measure one-half as much as the ergot employed; they are mixed and sufficient alcohol added to make the liquid of 25 per cent. alcoholic strength, or one-third as much as the aqueous solution. After standing the liquid is filtered and the gummy residue washed with so much 25 per cent. alcohol as to make the filtered liquid measure three-fourths or 75 per cent. of the amount of crude drug employed (volume for weight). To this glycerin is added to make the finished preparation represent the amount of crude ergot originally used, pint for pound. As will be seen, this preparation contains 18 per cent. alcohol, rendering it unobjectionable for hypodermic use. Fluid ergot is an opalescent, amber-coloured liquid possessing a peculiar musty odour. It remains pretty clear unless exposed for a long time to the light or atmosphere. It should, therefore, be kept in small well-filled bottles in a dark place. As stated above, the writer introduced this preparation immediately after the Dragendorff and Podwissotzky investigation; similar products at once appeared under different names, and Hager in his 'Supplement' gives a process for what he terms *extract. secalis corn. purif.* or *ergotina rationaliter parata.* The ergot, according to this process, is extracted with benzin and alcohol, and then exhausted with water, and the liquid concentrated to one-half the bulk of the drug; here the similarity ceases, as Hager employs sufficient alcohol to make the mixture represent 60 per cent. alcohol by volume which precipitates the gum, etc., but also *scleromucin* and renders it necessary to again recover the alcohol by distillation. After this is accomplished the liquid is transferred to a dialysator and dialysed. This part of the process the writer thinks is entirely unnecessary, and almost, if not entirely, impracticable, as decomposition sets in very rapidly in dilute aqueous solution of ergot. The formula for a preparation termed M. Yvons' Solution of Ergotin, appears in Lloyd's 'Supplement to the American Dispensatory.' In this process the crude ergot is extracted with water acidulated with tartaric acid, which is *irrational.* Moreover, the amount of alcohol used in precipitating the aqueous solution is *too* great (70 per cent.), being even more than Hager employs, that all the *scleromucin* and part of the *sclerotic acid* is in danger of being thrown out of solution. Further, to the finished preparation salicylic acid is added to preserve it from change, which is not desirable. After a series of experiments the writer has come to the conclusion that the gummy matter is precipitated with 25 per cent. of alcohol, and as this is all that is necessary to free the liquid from, the employment of more spirit would not be desirable in administration, or entail redistilling, and what is of greater importance the scleromucin, which ranks second in medicinal value of all the constituents of ergot, would not be represented in the preparation. The previous exhaustion of oil, and especially the alcholic extractive

favours the easier precipitation of the inert matter with a small percentage of alcohol.

In the commencement of this paper the different methods in preparing ergotin were referred to as indicating the conflicting views held by the various framers of the processes for its preparation. The subject had received scarcely any attention till C. Lewis Diehl's article in the *American Journal of Pharmacy* of Nov. 1881. Mr. Diehl points out the indefinite instructions in Bonjean's original process, in regard to the amount of alcohol used in the precipitation, making also comparative experiments with Carles' and the formula official in the German pharmacopœia. The fact that no difference in yield of ergotin resulted between Carles' and Bonjean's method, in which 77 and 65 per cent., respectively, of alcohol was used, may be accounted for on the theory that all the sclerомucin had been precipitated when the alcoholic strength had reached 65 per cent., and that no further precipitation took place to any great extent, till the sclerotic acid is thrown down, which does not commence till the alcoholic strength reaches 80 per cent. The large yield of ergotin obtained by Mr. Diehl by the method of the Phar. Ger. is accounted for by the fact that the alcoholic strength did not exceed 30 per cent., and the preparation contained therefore *all* the *sclero-mucin* and a great proportion of oil and resinous matter, which are not precipitated till the alcoholic strength reaches 40 per cent. The presence of oil was also shown by the fluidity of the preparation and the resinous matter by its colour. An ergotin of firm pilular consistence cannot be obtained by these methods unless the ergot is previously extracted with benzin, and, still better, subsequently with strong alcohol. The extraction of oil and resin (?) is not advocated on the ground *alone* of rendering the ergot more readily extracted by water, although free from oil, the drug is more readily disintegrated as it lacks that horny surface, but *more* on account of that the *ergotin* will be more concentrated and of better *consistence.*

Sclerotic Acid.—In preparing some sclerotic acid, an opportunity presented itself to determine whether the *purified ergot* was more readily exhausted with water than the crude drug. Ten pounds of purified ergot was macerated and expressed with three times its weight of water in three equal portions, the liquid concentrated to five pounds and alcohol added to bring the mixture to 50 per cent. and filtered. The filtrate was concentrated to a syrup in consistence and alcohol added to make the liquid of 85 per cent. alcoholic strength. The sclerotic acid was quickly precipitated and obtained quite pure after washing with 85 per cent. alcohol. It was of a slate colour, but soon turned brown. Ten pounds of crude ergot in coarse powder was macerated for twelve hours with water, packed in a percolator and eight pints of percolate obtained, again macerated and a second similar quantity of liquid received, alternate maceration and percolation was enforced till the drug was exhausted, which was scarcely accomplished when thirty-two pints of fluid had been recovered. When the orifice was opened after the second maceration quite an explosion took place, indicating the formation of carbonic acid gas, and the process must therefore be watched. The liquids obtained were treated in the same manner as above, nearly 25 per cent. of matter being precipitated and rejected; when the alcoholic strength reached 85 per cent. the sclerotic acid was thrown down, but so contaminated with resinous matter that subsequent washing with alcohol failed to purify it; comparative estimation of the acid was therefore abandoned. Ergotin is largely used in pills and prescribed in pretty large doses, it is therefore desirable to have a preparation of firm consistence and as concentrated as practicable. The following formula is therefore proposed as yielding a product possessing these advantages. The purified ergot as above is exhausted with water as in the preparation of fluid ergot, and the liquid evaporated till one-half the volume of the ergot used, alcohol is added to 25 per cent., after standing filtered and the filter washed with 25 per cent. alcohol. The alcohol is recovered and the aqueous solution evaporated to pilular consistence. The yield is about 15 per cent. of the drug used. This ergotin will be found to keep well, it is not very hygroscopic and one grain represents about six grains of ergot. It can be mixed with sugar-of-milk in various proportions, when of hard consistence and the desiccation completed until it is sufficiently brittle to be triturated to a fine powder. By adding sufficient sugar-of-milk to replace the inert matter of the drug, namely 85 per cent., saccharated extract of ergot is obtained. It was on account of the difficulty experienced in preparing this in a powdered form, which led the writer to extract the fat primarily from the drug. By adopting this procedure all impediments are removed to obtain an extract in the powdered form with even less proportion of sugar-of-milk than the above.

In conclusion, the writer will state that there is no doubt that this extraction of fat from crude drugs with a cheap solvent like benzin can be carried on to a considerable extent, and the extract subsequently obtained can be reduced to, and preserve its pulverulent condition without difficulty, rendering the admixture of absorbent powders in such *great* and *deceiving* proportions unnecessary. But great care should be exercised that the active principles of the drug are not also *even partially* extracted. The extraction of fat, in nux vomica, with benzin, seems, according to some authorities, coupled with danger of dissolving some of the alkaloids, although the writer thinks this is due *more* to an excessive use of the solvent employed. In order to extract the fat from a drug by benzin it is not necessary to have it in fine powder, nor subject it to the action of the solvent by long maceration, as the fat is rapidly taken up. In the main an equal portion, volume for weight, of the benzin is sufficient, and this can be lessened by increasing the height of the column of the drug operated on. With ergot, however, no precaution is necessary, as the alkaloid is sought to be discarded, and the benzin has no action on sclerotic acid of sclerомucin.

FERROUS CITRATE AND ITS DOUBLE AND SECONDARY SALTS.*

BY R. ROTHER.

When two or more dissimilar elementary molecules unite, the force which holds each individual molecule together is redirected and distributed in a coincident aggregate whereby the compound molecule is maintained. When the utmost power of all the molecules is exerted the proportional energy of each is termed the atomicity, quantivalence or simply valence of the particular element implied. Since all forces, being modes of motion, are interconvertible, there must be stages during the conversion when the prior and post-prior states are no longer of a kind. Neither is the post-prior mode like the new condition of which it is the immediate antecedent. These peculiar and highly interesting phases may be termed transition forces. They are the dynamic analogues of the states of aggregation that intervene between the solid, liquid, gaseous, and ultra-gaseous conditions of matter. When chemism begins to merge into mere cohesion the bonds of atomicity suffer a further and continuous subdivision no longer definitely characterized in terms of quantivalence. This transitory state may therefore be properly distinguished as ultra-valence. It becomes evident in such cases where compound molecules of saturated valence still continue to combine, and where elementary molecules coalesce with seemingly abnormal capacities. In the opposite direction we also find that many elements most usually do not exert their full atomic power. Such instances are termed apparent valence. This important condition is most thoroughly representative of chemism at its climax. Apparent valence generally gives rise to

* From the *American Journal of Pharmacy*, Jan. 1883.

compounds of the greatest stability owing to the fact that the intra-molecular affinities have been subjected to fewer subdivisions than in the states of higher atomicity. In chemical notation some difficulty is experienced in expressing the formulas of compounds containing the same element in different degrees of valence. Although the atomicity is most usually noted by indices, a much more striking and definite notation would be acceptable. To illustrate a change in that direction the ferrous condition might be indicated by Fo, the ferric by Fi, and the ferrate by Fa. Other elements of varying atomicity could be similarly treated. In course of time ultra-valence will probably command commensurate notice. The chemical notation used in pharmacy is often conveniently abbreviated, especially to avoid writing out in full the complicated formulas of the acids of carbon. But the system employed is not only confusing, but erroneous. The abbreviation for citric acid, for instance, was written Ci, and in its combinations it still appeared as Ci. Now the proper and consistent plan is to designate the radicles only in shortened forms, and hence citric acid may be written H_3Ci.

On a former occasion when treating of ferro-ferric or ferroic citrate the writer obtained the formula for ferrous citrate from a faulty source, stating it to be a triferrous salt, thus, Fe_32Ci. When recently operating on definite quantities of material the writer, however, found that it is a diferrous citrate, thus, $Fe_2H_2Ci_2$, or FeHCi, that is, in fact, a double citrate of iron and hydrogen, or, properly, a hydroferrous citrate. Correctly speaking, a double, triple, etc., salt is invariably derived from a single acid by substitution of the basic hydrogen by one or more basic radicles partially, or by more than one basic radicle wholly. But when the conditions are reversed, that is, when one basic radicle unites with more than one acid radicle, secondary, tertiary, etc., salts are formed. Yet further, when a multiplicity of both acid and basic radicles converge to form a compound molecule then secondary double salts, tertiary triple salts, etc., are produced.

Ferrous citrate, when prepared by boiling citric acid with metallic iron, is a dingy white and sparingly soluble salt. Prepared, however, by acting on ferrous hydrate or carbonate with citric acid it dissolves rapidly in the generated ferric citrate formed by atmospheric oxidation and produces one of the numerous ferroic citrates. Owing to this peculiarity ferrous citrate was credited with such solubility as to be even deliquescent.

One equivalent of ferrous citrate treated with one equivalent of hydrosodic carbonate yields a very soluble apple-green amorphous double salt, the sodio-ferrous citrate FeNaCi, which is readily obtained in elegant scales. But when one equivalent of ferrous citrate is acted on by two equivalents of the carbonate a very soluble grass-green amorphous secondary double salt is formed, the sodio-ferrous hydrocitrate.

$$FeNa_2Ci(OH) \text{ or } \begin{matrix} Fe\text{—}(OH) \\ \diagdown \\ \diagup \\ Na_2 = Ci. \end{matrix}$$

Ferrous citrate heated with even four equivalents of sodic phosphate is not entirely dissolved, but the solution is deeply green, and on cooling yields a large crop of spiny crystals of sodic phosphate. Addition of citric acid to the heated mixture immediately separates a copious transparent green gelatinous precipitate, which requires a very large proportion of sodium citrate for solution. It is therefore evident that ferrous citrate cannot be successfully treated with sodic phosphate alone.

If two equivalents of sodio-ferrous hydrocitrate are mixed with two equivalents of sodic phosphate an abundant precipitate of ferrous phosphate, together with a deep green solution, results. An equivalent of citric acid now added dissolves the precipitate completely, or, if incorporated previous to the sodic phosphate, prevents the precipitation.

The admixture of one equivalent of sodic phosphate to two equivalents of sodio-ferrous citrate also occasions a precipitate of ferrous phosphate, redissolved by an equivalent of citric acid, or prevented when this is previously added.

Both of the above cases, therefore, show that half as much more citric acid as these double salts already contain counteracts the formation of precipitates insoluble in the presence of sodic phosphate. The resulting splendidly emerald-green solution contains two very remarkable amorphous salts, the one a double citrate of sodium and iron, the other a citro-phosphate of these metals. Their generation is represented by the following equation:—

$$2\,(FeNaCi) + H_3Ci + Na_2HPO_4 = FeNa_2H_2Ci_2 + FeNa_2H_2CiPO_4.$$

The hydro-sodioferrous citrate and citrophosphate may also be written thus:—

$$\begin{matrix} Fe = Ci \\ \diagup \\ Na_2 \\ \diagdown \\ H_2 = Ci \end{matrix} \qquad \begin{matrix} Fe = PO_4 \\ \diagup \\ Na_2 \\ \diagdown \\ H_2 = Ci \end{matrix}$$

This saline mixture admits of scaling, but not so readily and elegantly as the sodioferrous citrate above described.

The object in preparing these compounds was to employ them in the various phosphatized and citrated mixtures where permanency of solution is a desideratum. Hence their behaviour towards phosphoric acid is interesting.

Phosphoric acid, when added to any of these salts in moderate proportion, discharges their colour to a great extent, but wholly when added in sufficient excess. The acidulated solution is apparently permanent; however, with a certain inferior proportion of acid, a slight precipitate of ferrous phosphate appears; but the sodioferrous citrate comports itself, in a particularly special manner, distinct from all the rest of these compounds. A sufficient excess of phosphoric acid added at once to this salt produces a clear, permanent and perfectly colourless solution; yet, when phosphoric acid is added in such amount as to leave the solution lightly green, a profuse cream-coloured granular precipitate of the noteworthy triferrous phosphate, $Fe_3(PO_4)_28H_2O$, is produced. This precipitate, when once formed, requires a much larger proportion of phosphoric acid for solution, and also considerable time. Chlorhydric acid dissolves it more freely, yet slowly. Nitric acid attacks it with difficulty after much time. Normal monad citrates are also indifferently active. The reason for its formation under such peculiar conditions is that the salt which yields it contains no hydrogen.

Ferrous citrate is best prepared by heating for about three hours, or until reaction ceases, 56 parts of very fine iron filings with 210 parts of citric acid and a nearly constant 1500 parts of water. As the iron always contains carbon, the quantity will practically have to be about 60 parts. Since the citrate only serves to prepare the soluble forms, any amount of iron in excess is immaterial.

The sodioferrous citrate is prepared by adding to the ferrous citrate of the above process 84 parts of hydrosodic carbonate, heating until effervesence ceases, setting the solution aside till the carbonaceous residue has subsided, decanting the clear liquid, evaporating it to a syrupy consistence, and spreading it on glass or porcelain plates to dry. A definite solution can also be kept on hand.

The sodioferrous citrophosphate is prepared by adding 105 parts of citric acid and 179 parts of sodic phosphate to the product of the preceding process, and proceeding in a similar manner as there directed.

The ferroic citrate above mentioned is a very useful compound, and could, perhaps, in many instances, supplant the ferric citrate. Nevertheless, a complete conversion of the ferrous into ferric citrate would be very desirable. At one time the writer deemed it impossible to convert the ferrous citrate by means of nitric acid, but recent quite successful trials show that it can be done. If 45 parts of nitric acid is added to the ferrous citrate above obtained, and carefully heated to dryness, perfect transformation is effected.

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POLARIZATION OF LIGHT AND ITS PRACTICAL APPLICATIONS.

IT was a well-deserved compliment paid to Mr. D. CORNELIUS O'SULLIVAN when the Council of the Institute of Chemistry invited him to deliver before the members of its guild and their friends a lecture upon the "Polarimeter and its Practical Applications." If to a minor degree those feelings of reluctance and misgiving which the lecturer confessed himself to have at first experienced still existed, they must surely have been dispelled by the unmistakable signs of appreciation which were manifested by a large and attentive audience. A description of a NICOL'S prism formed a convenient and rational starting point as affording a means by which there could be obtained a single beam of polarized light producing a single image. Two such prisms used together constitute respectively the polarizer and analyser. On placing the prisms one before the other light passes only when the vibrations in the image transmitted by the one are parallel to those transmitted by the other. If now the analyser be turned, the light will be seen to fade, and will be totally extinguished when at right angles to the polarizer. Those instruments which have been devised for the purpose of determining the position of polarized flames are known as polarimeters, and in their construction are dependent on the phenomena produced by plane and circular polarization.

If a ray of light be caused to pass through a plate of quartz, cut perpendicular to the axis, it is divided into two, the vibrations in each being circular and in opposite directions. Hence the terms right-handed and left-handed are applied to the direction of the circularly polarized ray. To distinguish between the two kinds of rotation it is only necessary to imagine oneself looking in a direction opposite to that in which the light is moving; if the plane of vibration be from left to right its rotation will be left-handed and if the conditions be reversed it will be right-handed. Further, it is important to remember that the different coloured rays after leaving the quartz enter the analyser in a condition of plane polarization. It was here observed by the lecturer that a very delicate test for determining the displacement of the plane of polarization was by the use of a bi-quartz arrangement. This consisted in placing side by side two parts of a quartz plate, one being right-handed and the other left-handed quartz. The change of colour in the one would therefore be from red to violet, while in the other this order would be reversed. A uniformity or identity of colour would be observed at the point of transition between the violet and the red. This is known as the neutral tint—*teinte sensible*—and the slightest change in the plane of polarization is followed by the appearance of one of the two distinctive colours (red or violet). Following these observations came a description of JELLET'S prism and saccharimeter; CORNU'S prism; the JELLET-CORNU; LAURENT'S semi-quartz disc; the LAURENT-SAVART'S prism; the WILD and HOFMANN—Quartz Wedge Compensators; the SOLEIL; SOLEIL-DUBOSCQ; SCHEIBLER. The various modifications introduced in these instruments with the object of determining with greater precision the amount of change of the plane of polarization produced by the interposition of an optically active substance here received a merited share of consideration. BIOT'S law, which affirms that the angle of deviation is proportional to the length of the column of liquid and to the quantity of substance contained in that given column, was declared to be true only when the substance was examined under uniform conditions. The rotatory power of a body was alleged to vary in accordance with the solvent employed, the presence of inactive bodies, and the temperature of its solution at the time the observation was recorded. The lecturer appeared less happy in his efforts to explain the meaning of the terms *absolute* and *apparent* specific rotatory power as applied to liquids and solids in solution optically active. The employment of specific rotatory power as a means of testing the purity of those organic bodies which possess the power of displacing the plane of polarization received but an insignificant share of attention, direct reference only being made to quinine and to the terpenes generally. The practical value of the polarimeter in its application to purposes of investigation was little more than hinted at in a passing allusion to the hydration of lactose.

The decomposition of lactose by dilute sulphuric acid into two well-defined bodies, galactose and dextrose, each possessing a rotatory power corresponding to $+83{\cdot}3$ and $+56^{\circ}$ respectively, was instanced as an illustration of the usefulness of prismatic analysis in discriminating between simple bodies and mixtures. At this stage the lecturer, outstripped by the lapse of time, was unavoidably compelled to suppress many important facts, the headings of which found a place in his published syllabus. The hope that the lecture would be published in a complete form found expression through the Chairman, Dr. ODLING, and was unanimously endorsed by the audience. It is not, there-

fore, too much to expect that the substance of Mr. O'SULLIVAN's lecture will shortly appear in the form of a monograph and will be placed at the disposal of those who are associated with the Institute of Chemistry.

THE CALENDAR OF THE PHARMACEUTICAL SOCIETY.

THE 'Calendar' of the Pharmaceutical Society for 1883 is now ready and copies may be obtained from the Secretary. We observe that this useful annual has now reached no less than 500 pages, for a list of the contents of which we refer to an advertisement on another page.

In addition to the lists of members and others connected with the Society, the donors and subscribers to the Benevolent Fund, the Charter and the three Acts of Parliament directly referring to the establishment and functions of the Society, the 'Calendar' contains abstracts from numerous Acts of Parliament and General Orders issued by Government Departments, the provisions of which are of importance and interest to pharmacists generally. The questions set at the four Preliminary examinations in 1882, all the papers given last year in the competitions for the JACOB BELL Memorial Scholarships, and for the School of Pharmacy prizes are also published in the 'Calendar.'

Once more we must reiterate that we should be glad if the Society's 'Calendar' were more widely known and more frequently consulted, as many of our correspondents would thus be saved the trouble of seeking elsewhere the information it contains, which has been specially compiled for the class to which our readers belong.

POISONING BY MISADVENTURE.

ANOTHER of those deplorable cases of fatal poisoning which raise a doubt whether the victims were sufficiently aware of the dangerous character of the preparations they have administered to themselves has during the week formed the subject of an inquest held by Dr. DANFORD THOMAS at Paddington. The medical evidence went to show that death resulted from an overdose of a narcotic preparation. Though it was, of course, impossible to say whether that had been taken intentionally or not, we must of necessity concur in the regret expressed that the practice of taking these dangerous sleeping draughts is so much on the increase.

We desire also to direct attention to the remark of the Coroner that the law would seem to encourage this practice, for though a person going to a chemist's shop and asking for anything which was known to contain poison, would not be supplied with it without signing his name and address, it is possible to purchase patent medicines containing any amount of poison without the least restriction or safeguard. We gladly take the opportunity of endorsing the opinion expressed by the Coroner that in this respect the law is most defective and ought to be amended.

THE NEXT EVENING MEETING.

AN Evening Meeting of the Pharmaceutical Society will be held on Wednesday next, February 7, when the following papers are to be read:—

"A Research on the Alkaloid Gelsemine and some of its Crystalline Salts." By A. W. GERRARD, F.C.S.

"Aromatic Spirit of Ammonia." By Dr. THRESH.

"An Apparatus for Continuous Extraction." By WYNDHAM R. DUNSTAN and F. W. SHORT.

"The Assay of Nux Vomica." By WYNDHAM R. DUNSTAN and F. W. SHORT.

"The Constitution of Liquor Sodæ Chloratæ." By WYNDHAM R. DUNSTAN and F. RANSOM.

"The Action of Chlorine upon Solutions of Sodium Carbonate." By WYNDHAM R. DUNSTAN and F. RANSOM.

The next meeting of the Chemists' Assistants' Association will be held on Tuesday evening, Feb. 6, at 9 o'clock precisely, at University Chambers, 53, Conduit Street, W., when a paper will be read by Mr. W. Temple Cooper, Jun., on "Practical Hints on the Examination of Urine."

* * *

Some drysalters and grocers who were recently charged at Strassburg with the sale of adulterated saffron escaped conviction through two curious technicalities. As by the French law, which still rules the practice of pharmacy in Elsass-Lothringen, saffron can not be sold for medicinal use by others than pharmacists without incurring a penalty, it was held by the local tribunal that these sales must have been made for tinctorial purposes; and on the further ground that grocers commonly sell carthamus under the name of saffron, as a substitute for use in dyeing, the accused were aquitted.

* * *

Two medals of gold and two of silver have been placed at the disposal of the National and Central Horticultural Society of France to be awarded to the authors of the best essays on the popular names of plants, especially of those that are cultivated.

* * *

The curious theory has been put forward recently by Dr. W. A. Hammond, of New York, that the seat of instinct is in the medulla oblongata, his argument being based among other observations upon the capacity in acephalic monsters for suckling and similar instinctive acts, providing the medulla be present.

* * *

The *Sanitary Record* mentions the prosecution of a New York grocer for selling as pure cream of tartar a mixture consisting of 92 per cent. of ground gypsum and 8 per cent. of tartaric acid. After more than a day spent in raising and disposing of technical objections, amongst which was one as to the Pharmacopœia being quoted in evidence, a fine of ten dollars was imposed.

* * *

According to some returns recently quoted by Sir J. Fayrer the number of human beings known to have met their death through snake bites in India during the year 1881 was 18,610. Of these deaths 9204 occurred in the Bengal Presidency alone.

* * *

In a discussion on the question of "women pharmacists" in the United States it has been stated that since the year 1868 eleven ladies have graduated

from the department of pharmacy in the University of Michigan, but of these nine are not now practising pharmacy. The *Weekly Drug News and American Pharmacist* remarks upon this: "What woman is capable of doing must not be confounded with what she does. . . . After fifteen years the foremost college of pharmacy in the country has been successful in graduating two women who are following the profession.

* * *

The *British Medical Journal* states that in Wisconsin any druggist, apothecary or vendor of medicine is liable to a fine of ten dollars and costs for refilling a prescription marked, "No duplicate."

* * *

Referring to a case of death by poisoning at Poplar, through the substitution of carbolic acid obtained for disinfecting purposes for a medicine, the *British Medical Journal* remarks that "there ought surely to be some method of treating carbolic acid, either by colouring the liquid strongly, or by the use of strongly smelling powders in lieu of liquid, which should put an end to such frequent disasters."

* * *

In a criticism upon the new United States Pharmacopœia, after referring to the preponderance of pharmacists on the Committee of Revision, Dr. Squibb remarks, rather pathetically, that "the prevailing drift of the times seems to be for the medical profession to turn over its most valuable and most practical interest to pharmacy, and that pharmacy as a trade takes no more advantage of this unsafe and unwise drift, is highly creditable to the leaders of that branch of medicine." But Dr. Squibb admits that of the resulting volume "it can hardly be said with too much emphasis that it seems to be by far the best Pharmacopœia of the time." This is a candid admission from the medical gentleman who failed to persuade the American Medical Association to undertake the work.

* * *

The occasion of the resignation by Professor Bentley of the post he has for so many years held as Dean of the Faculty of the Medical Faculty of King's College is to be made the opportunity by many of his old pupils to present him with a memorial of their regard and esteem. The Treasurer of the Fund is Professor John Wood, F.R.S.

* * *

According to the *Lancet* the annual drug bill of one of our largest metropolitan hospitals includes among its items ten tons of linseed meal for poultices, £125; lint, £443; cotton-wool, £183; carbolic acid, £223; carbolized muslin, £180; spirit of wine, £585; potassium iodide, £80; silver nitrate, £111; quinine, £300; cod liver oil, £190; bismuth preparations, £93.

* * *

The "Southall Choral Society" gave its first vocal and instrumental concert on Saturday last at the Priory School rooms in Birmingham. There was a large attendance, and the programme was well sustained by the ladies and members of the choir.

* * *

At the meeting of the Society of Chemical Industry, to be held at the Chemical Society's Rooms, Burlington House, on the 5th inst., Mr. A. H. Allen, of Sheffield, will read a paper on "The Chemistry and Methods of Examining Fixed Oils."

Transactions of the Pharmaceutical Society.

EXAMINATIONS IN EDINBURGH.

January 24, 25 *and* 26, 1883.

Present on each day—Mr. Carteighe, President; Messrs. Ainslie, Baildon, Clark, Gibson, Gilmour, Kininmont, Nesbit and Stephenson.

Professor Maclagan was also present on behalf of the Privy Council.

MAJOR EXAMINATION.

24*th.*—*Four* candidates were examined. *Two* failed. The undermentioned *two* passed, and were declared qualified to be registered as Phamaceutical Chemists:—

Foggitt, John Blackett .....Thirsk.
Gilbert, William John .....Ventnor.

MINOR EXAMINATION.

24*th.*—*Eight* candidates were examined. *Four* failed The undermentioned *four* passed, and were declared qualified to be registered as Chemists and Druggists:—

Boyd, Alexander .....Glasgow.
Brown, John .....Stirling.
Buchanan, John .....Bonnyrigg.
Crawford, Thomas .....Leith.

25*th.*—*Eleven* candidates were examined. *Five* failed the undermentioned *six* passed, and were declared qualified to be registered as Chemists and Druggists:—

Harris, Stephen..... .....Droitwich.
Hudson, William .....Sunderland.
Ivatt, Albert.....Cottenham.
Jary, Joseph James .....South Shields.
Jenner, Harry Albion .....St. Leonards.
Mackenzie, James Calder .....Grantown.

26*th.*—*Ten* candidates were examined. *Six* failed. The undermentioned *four* passed, and were declared qualified to be registered as Chemists and Druggists:—

Pirie, William .....Arbroath.
Raine, Ralph William.....Newcastle-on-Tyne.
Stirling, George .....Dunoon.
Turner, Alexander .....Dumfries.

Provincial Transactions.

LEICESTER CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

On Wednesday, January 24, 1883, a lecture was delivered in connection with the above Association, on "Flowers: their Structure and Arrangement," by Mr. F. W. Lewitt.

In the absence of the President, the chair was occupied by Mr. J. Garrett.

In the course of an instructive lecture Mr. Lewitt drew attention to the difficulty which has been experienced in endeavouring to define a flower, and pointed out some of the definitions which had been made by botanists. The arrangement of flowers on the axis of growth was shown and the structure of the different parts and their functions were displayed and by the aid of diagrams ably brought before the audience.

The Chairman proposed a hearty vote of thanks and, upon Mr. G. M. Winter seconding it, in a few appropriate remarks, it was accorded to the lecturer.

Proceedings of Scientific Societies.

SOCIETY OF CHEMICAL INDUSTRY.

The Present Condition of the Soda Industry.*

BY WALTER WELDON, F.R.S.

About a fortnight ago, the *Times* spoke of the manufacture of soda by the Leblanc process as being, "to some extent, a dying industry." Although I hope to show this evening ground for believing that that industry is not going to die just yet, it has certainly for some time past been in a condition by no means satisfactory to the greater number of those whose capital is engaged in it. For manufacturers of soda by the Leblanc process recent years have been years, in very many cases of loss, and in not a few cases of disaster. Of twenty-five alkali works which were in operation in the neighbourhood of Newcastle-on-Tyne a very few years ago, only thirteen are in operation now; and of the other twelve,† not fewer than eight have been actually dismantled, in utter despair of its ever again being possible to manufacture soda in them by the Leblanc process except at an absolute loss. The alkali-making districts of Lancashire have advantages over the Newcastle district in respect alike of the price of salt, of facilities for supplying the American market, and of nearness to certain of the great English centres of soda consumption; but, nevertheless, even in Lancashire some seven or eight alkali-works are standing idle, and but few of the others are working up to their full capacity. In Belgium, where there are five or six works which formerly made soda by the Leblanc process, matters are even worse, since in that country the manufacture of Leblanc soda has entirely ceased. The only other European countries in which the soda-industry as yet exists are France, Germany and Austria. In these countries the soda-manufacture is protected by the import duties which are stated in the following table:—

Import Duties per Ton.

	France.	Germany.	Austria.
	Francs.	Marks.	Florins.
Soda-ash	41	25	12
„ crystals	19	15	8
Caustic soda	64	40	40
Bleaching powder	35·5	30	15

—duties which, I believe, more than compensate for the greater cost of raw materials in those countries than in England; while in all these countries there is, moreover, a large demand for that bye-product of the Leblanc process, hydrochloric acid. Notwithstanding that the French, German and Austrian manufacturers of Leblanc soda have thus two very sensible advantages over their fellow manufacturers in this country, they have nevertheless grave cause for anxiety: the French manufacturers, indeed, in part owing to a special circumstance which I will mention presently, having reason to regard the future, not only with alarm, but even with dismay.

From information kindly supplied to me by manufacturers in all the countries in which the soda-industry is practised, I have been enabled to draw up a statement of the present total soda-production of the world, and of the proportions in which that production is divided between the Leblanc process and the ammonia process. In drawing up the following table, I have converted all the figures supplied to me, alike those for soda-ash, those for crystals, those for caustic soda, those for bicarbonate, and those for black-ash sold as such, into terms of pure Na_2CO_3:—

Present Soda Production of the World.

	Leblanc Soda.	Ammonia Soda.	Totals.	Ammonia Soda per cent. of Total Soda.
Great Britain	380,000	52,000	432,000	12·0
France.....	70,000	57,125	127,125	44·9
Germany.....	56,500	44,000	100,500	43·8
Austria.....	39,000	1,000	40,000	2·5
Belgium	...	8,000	8,000	100·0
United States	...	1,100	1,100	100·0
Total...	545,500	163,225	708,725	23·0

This table shows that the total quantity of soda now being manufactured annually is nearly 710,000 tons, and that of this quantity more than 163,000 tons are produced by the ammonia process.

I need scarcely say that it is to the very rapid growth of this latter process that is mainly due that condition of the Leblanc process which I have endeavoured to indicate.

Although it is now more than forty-seven years since the ammonia process was first proposed by Dyer and Hemming, it is less than seventeen years since that process was first realized industrially. As an industrial process, capable of being worked continuously and with satisfactory commercial results, the ammonia process dates only from 1866, being the year in which M. Ernest Solvay, of Brussels, began to produce ammonia soda at works which he had established for the purpose at Couillet, near Charleroi. M. Solvay has now two other ammonia soda works in operation,—one in France, at Varangeville-Dombasle, near Nancy, and one in South Germany, at Wyhlen, in the Grand Duchy of Baden,—and by his courtesy I am enabled to place before you the following statement of the quantities of ammonia soda which he has manufactured in each completed twelve months from the 1st of May, 1866:—

		Tons.	
1866—67	...	179	Couillet only.
1867—68	...	465	
1868—69	...	719	
1869—70	...	940	
1870—71	...	1,862	
1871—72	...	2,805	
1872—73	...	3,423	
1873—74	...	3,980	
1874—75	...	4,678	
1875—76	...	5,768	Couillet and Dombasle.
1876—77	...	11,579	
1877—78	...	19,247	
1878—79	...	25,023	
1879—80	...	32,326	
1880—81	...	42,669	Couillet, Dombasle, and Wyhlen.
1881—82	...	53,400	

These figures come down to the 30th April last. Since that date, however, M. Solvay has increased his production by nearly 60 tons per day, or 21,000 tons per annum, so that he is now making ammonia soda at the rate of very nearly 75,000 tons a year. He is thus making ammonia soda on nearly three times the scale on which he was making it four years ago, and on nearly twice the scale on which he was making it only two years ago. In France and Germany, M. Solvay's great success has tempted other manufacturers into the field, and, although none of them

* A paper read before the London Section of the Society of Chemical Industry, at the Chemical Society's Rooms, Burlington House, London, January 8, 1883.

† The quantity of salt decomposed in these twelve works was about 67,000 tons a year. The quantity decomposed in the thirteen works still in operation is about 220,000 tons a year.

are as yet large makers, their total production amounts to fully 35,000 tons per annum, raising the total Continental production of ammonia soda to about 110,000 tons per annum out of a total production by both processes of 275,000 tons. Of the total soda now being made on the Continent, therefore, about 40 per cent. is being made by the ammonia process. While the quantity of Leblanc soda made in France has neither increased nor diminished during the last few years, the quantity of Leblanc soda made in Germany and Austria has increased by several times the quantity formerly made in Belgium; so that not only these 110,000 tons of ammonia soda per annum, but also fully 25,000 tons per annum of Leblanc soda, have been added, comparatively recently, to the soda production of the Continent: going partly to supply increased consumption, but largely to diminish importation from England. And of this vast increase in the Continental production of soda,—four-fifths of which increase is due to the ammonia process,—two-thirds have sprung into existence within the last five years, and a large part of those two-thirds within only two years.

In England, within the last two years, the production of ammonia soda has been nearly trebled. The ammonia process is practised in this country as yet only by one firm. In 1873 it was not in operation in this country at all. In that year our Honorary Foreign Secretary, Mr. Ludwig Mond, arranged with M. Solvay for the right to work under his patents in this country, and in the following year, in conjunction with Mr. J. T. Brunner, Mr. Mond began to make ammonia soda at Winnington, near Northwich. Messrs. Brunner and Mond began on a very modest scale, their production in 1875 not exceeding 2500 tons; but in 1878 their production rose to 10,000 tons; in 1880 it was 18,800 tons; and it is now at the rate of not less than 52,000 tons per annum, or at very nearly three times the rate of only two years ago.

The competition of the ammonia process with the Leblanc process has thus attained its present degree of seriousness only very recently indeed. It has come upon the makers of Leblanc soda almost like a thunderbolt out of a clear sky.

And, serious as that competition is already, it is about to become even more serious still. Not only is it to be expected of the existing ammonia soda works that those of them which have recently so greatly increased their production will go on increasing their production, and that those of them which have more recently started will grow as the older ammonia soda works have grown, but new ammonia works are being built. M. Solvay, who has already, as I have said, a work in operation in South Germany besides his French and Belgian works, and who is already by far the largest soda-maker in the world, will soon have a work in operation in North Germany also, at Bernburg, near Stassfurt; and he is now, moreover, erecting a work in Russia, and also a work in the United States, and is on the point of commencing the erection of a work in Austria, so that by-and-by he will be making soda in no fewer than seven distinct works, in six different countries. In addition to all this, a large work to make ammonia soda, not on M. Solvay's system, but on a system modified from that practised at Dieuze, is being erected near Stassfurt by the Company of Buckau; an ammonia soda work is building, and will be started in the spring, at Favorznow, near Cracow; and one is about to be built at Siebenburgen, in Transylvania,—not to speak of the intention of Messrs. Bell Brothers to build an ammonia soda work at Middlesbro. The new works which are thus in course of construction, and some of which are nearly completed, will throw on the market more ammonia soda, to the extent of not less, from the commencement, than from 65,000 to 70,000 tons a year.* For Leblanc soda makers, it is thus as though ammonia soda had latterly rained from the skies during two days out of every three, and the shower were now on the point or becoming continuous.

While face to face with so serious an amount of competition, actual and imminent, on the part of the ammonia process, the Leblanc process pure and simple is now further threatened with what is surely the "most unkindest cut of all," namely, with competition from the Leblanc process itself—combined with the extraction of copper from Spanish pyrites.

To explain how this has come about, I must remind you that the sulphuric acid used in the Leblanc process is now invariably manufactured from the sulphur of pyrites; that the pyrites used in this country is now almost exclusively either Spanish or Portuguese pyrites, containing two to three per cent. of copper and very small quantities of silver and gold; that after most of the sulphur has been burnt off from the pyrites, as the first step in the manufacture of sulphuric acid, the residual "burnt ore," or "pyrites cinders," as it is called, is treated by the wet way for the extraction from it of copper, and in most cases now of gold and silver also;* and that what remains when these have been extracted is an almost pure oxide of iron, which finds a ready sale for use for various purposes in connection with the manufacture of iron and steel. The supply of this cupreous pyrites is for the most part monopolized by three great companies—the Tharsis Company, the Rio Tinto Company, and Messrs. Mason and Barry. These companies not only supply nearly the whole of the pyrites used in the manufacture of sulphuric acid in England, but the Rio Tinto Company also supplies annually some 60,000 tons of pyrites to Germany, and is also beginning to send pyrites into Austria. None of the three companies, however, has been able to sell an ounce of pyrites in France.

The reason of this is that in France itself there are two large deposits of pyrites, both belonging to soda-makers: one belonging to the Compagnie de St. Gobain, and the other to MM. Pechiney et Cie. Each of these companies itself uses its own pyrites; and the former of them supplies with pyrites the greater number of the other alkali-makers in the North of France, while the latter

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* As no complete list of ammonia soda works has yet been published, it may be interesting here to give one.

The following list includes all the works now actually in operation:—

England:—	France:—
Winnington	Dombasle
Sandbach	Giraud
	Sorgues
Germany:—	St. Denis
Wyhlen	Lille
Duisburg	
Inowrazlaw	Belgium:—
Grevenberg	Couillet
Dieuze	
Trotha	Austria:—
Heilbronn	Boszko
Nürnberg	
Rothenfelde	United States:—
	Bay city

Ammonia soda works are now being built in the following localities:—

Austria:—	Germany:—
Favorznow	Stassfurt
Siebenburgen	Bernburg
?	
	United States.—
Russia:—	Syracuse.
Beresniki	

There is a reason why the locality of the work which M. Solvay is about to build in Austria may not yet be published.

* A German analysis of Rio Tinto pyrites gives the following results per 1000 kilos:—

495 kilos sulphur.
430 ,, iron.
30 ,, copper.
10 ,, lead.
26 grammes silver.
180 milligrammes gold.
150 grammes bismuth.

supplies with pyrites all the other alkali-makers of the South of France. It has obviously been impossible to sell Spanish pyrites to either of the two great soda-making firms, each of which thus has pyrites and by no means dear pyrites of its own, and each of which is a large seller of pyrites to other soda-makers; and the other French soda-makers, for the most part, have been precluded from even considering the question of changing to Spanish pyrites, if only by reason of the French habit of contracting for the supply of raw materials over very long periods. A French manufacturer's contract for raw materials is generally a contract for fifteen years; and most of the French soda-makers are now obtaining their pyrites under contracts which have yet a considerable time to run.

Under these circumstances the Rio Tinto Company has taken a remarkable step. To understand the motive to this step, it must be borne in mind that while French pyrites does not contain copper, and so has scarcely any value beyond that of the sulphur which it contains, Spanish pyrites has a considerable value in addition to its sulphur value. While the value of Spanish pyrites for the sulphur in it is equal to that of the best non-cupreous pyrites, its value for copper is greater than its value for sulphur, and, not to speak of its value as regards precious metals, it has also a considerable value for its iron. In this country, the cinders left after as much as possible of the sulphur of non-cupreous pyrites has been burnt off are considered to have no value at all; and even in France,—where the import duty on cast-iron is greater than the present price of Glasgow pigs, and where all forms of iron are therefore appreciably more valuable than in this country,—the cinders of non-cupreous pyrites are not worth more than three francs per ton. They always contain sulphur, and sometimes contain phosphorus. The cinders of cupreous pyrites, before treatment for the extraction of copper from them, also contain sulphur, and in larger quantity than the cinders of non-cupreous pyrites; but the treatment to which they are subjected for the extraction of their copper removes the whole of their sulphur, and also the whole of their phosphorus, if they have contained any, leaving a residual oxide of iron of great purity. This residual oxide, or "purple ore," as it is called, now sells in this country for 12*s.* per ton, and in France it would doubtless command a higher price.

Now, in this country a state of things has grown up under which the manufacturers of Leblanc soda derive no advantage from the value for copper and iron of the pyrites which they employ. The treatment of the cinders of cupreous pyrites has become in this country a separate industry, practised only in a few instances by alkali-makers themselves, but practised for the most part by companies or individuals who do not themselves make soda, but who either buy from soda-makers the cinders of pyrites of which the soda-makers have bought both values, the copper value as well as the sulphur value, or themselves buy both values, selling only the sulphur value to the soda-makers, or else buy direct from the pyrites sellers the copper value only: the pyrites sellers in such cases selling the copper value of their pyrites to one purchaser and its sulphur value to another. It is an industry which yields fair commercial profits, so that soda-makers may be incurring actual loss, while those who deal with the cinders of the pyrites from which the soda-makers have burnt off sulphur are at least making a living. And while the treatment of the cinders of Spanish pyrites is fairly profitable in this country, the greater value of iron and iron ores there than here would doubtless render it more profitable in France. It is true that coal is more costly in France than in England; but the quantity of coal required for treating pyrites cinders is not great.

The course, then, which the Rio Tinto Company is taking is this. Unable to sell its pyrites to the French Leblanc soda-makers, it has determined that the Leblanc soda made in France, or at least a large part of it, shall nevertheless be made by means of Rio Tinto pyrites, and to this end it has promoted a subsidiary company, "La Compagnie d'Exploitation des Minerais de Rio Tinto," which company is to make Leblanc soda in France and elsewhere, relying for its profits neither on soda nor on chlorine, but on copper and oxide of iron. For this company, soda and chlorine will be simply bye-products, which it will be glad to sell at a profit, if that may be, but which, if that may not be, it will be content to sell at the bare cost of manufacturing them. It will manufacture them only for the sake of converting Rio Tinto pyrites into pyrites cinders.

This new company proposes to operate upon an enormous scale. It has a capital of 1,200,000 pounds sterling, of which one-half is already paid-up, and there is talk of its building in France no fewer than five great works: one of which, designed, and to be managed, by Englishmen, it has already commenced, in the neighbourhood of Marseilles. The result cannot but be very grave for the existing French Leblanc soda-makers. and must inevitably affect the makers, both of Leblanc soda and of ammonia soda, in this country also.

Moreover, this new company will not confine its operations to France. Not only will it take Spanish pyrites to the United States, and there make sulphuric acid, extract copper, and obtain "purple ore,"—large quantities of which at present go from England to America,—but it will also build a large soda-making and copper-extracting work,—which will certainly affect the English alkali trade,—in the neighbourhood of Antwerp. The Leblanc process will thus be re-introduced into Belgium, not as a substantive process, but simply as a part of a combination of processes for the utilization of cupreous pyrites.

To such complexion has the Leblanc process come at last. Originally, soda was its only commercial product, the hydrochloric acid produced during the first stage of it being turned to no account. In time a demand grew up for chlorine, that hydrochloric acid began to be utilized, and the manufacturers of Leblanc soda now sent into the market two products, by each of which they gained profits. Then their soda ceased to be profitable, and became a kind of bye-product, which they continued to make only because they could not otherwise make chlorine. Now, Leblanc soda gives no profit at all, and chlorine none to speak of; and both have come to be regarded as secondary products, to be made only incidentally, and only because making them is essential to the application to certain ores of the wet method of extracting copper.

Returning to the ammonia process, when that process first began to threaten them, the makers of Leblanc soda comforted themselves by two considerations: one of which was that the ammonia process must itself tend to check its own extension, by reason of the loss of ammonia inseparable from that process so increasing the demand for ammonia as to materially raise the price of that body. They knew that the constantly increasing demand for ammonia for the purposes for which it was already employed had doubled its price within twenty years; and they thought that every further extension of the ammonia soda process must still further increase the market-value of ammonia, until at length the ammonia process would cease to have any advantage over the Leblanc process. So far, however, from that anticipation having been realized, despite the immense extension which the ammonia soda process has recently undergone, the price of ammonia is now beginning to fall. The delusion that it was impossible to collect the ammonia given off from coke-ovens without spoiling the coke is at last giving way before accomplished facts; ammonia is now being obtained commercially not only from coke-ovens, but also from another source, wholly unforeseen and unexpected; and the time, moreover, seems at last to have dawned when there will be collected and utilized

as ammonia at least a portion of the nitrogen of nearly all the fuel burnt either for industrial or for domestic purposes.

In France, ammonia has been collected from coke-ovens for a number of years past.* It is fully ten or twelve years since M. Carvés said to French coke manufacturers: "I wish you to try my system of making coke, but I do not ask you to risk one farthing in doing so. If you will permit me, I will build coke-ovens in your works at my own expense. I will guarantee you against all risk of the coke produced being of inferior quality; so that, if I fail, you shall be no loser. If I succeed, I will ask you for no money royalty, nor will I ask you to pay me for the coke ovens: I will only ask that you shall give me for a short term of years one-third of those products which I shall condense, but which, at present, you do not condense." This offer was accepted by some of those to whom it was addressed, with results quite satisfactory both to them and to M. Carvés. Quite recently, coke-ovens on the Carvés system have been erected in South Durham, and about three months ago ammonia from them began to appear in the market.

This fact, however, is not nearly so important as something which has been done simultaneously in North Durham. While the Carvés system of making coke gives important results, it has the disadvantage of requiring coke-ovens of a special construction. It could thus extend only in proportion as the existing coke-ovens were replaced by new ones; and replacement of the present ovens by Carvés ovens would naturally be a slow process. For a method of collecting ammonia and other volatile products from coke-ovens to obtain wide application rapidly, it must be a method applicable to existing coke-ovens; and a method applicable to existing coke-ovens at a very slight expense, has been recently devised by an English inventor, Mr. John Jameson, of Newcastle-on-Tyne. His method has now been in operation for nearly six months at the works of our vice-president, Mr. Hugh Lee Pattinson, at Felling, near Gateshead; and Mr. Pattinson authorizes me to state that he has "reason to be abundantly satisfied with the results." The products condensed are the products of the distillation of coal at a very low temperature. They include, per ton of Northumberland steam coal operated upon, an average of 11 gallons of oil, and ammonia equal to 12 pounds of ammonium sulphate. The oil is a crude paraffin oil, of 0·9 sp. gr., containing from 8 to 10 per per cent., according to the coal employed, of solid paraffin. The yield of oil will probably not be greatly increased; but it is expected that the yield of ammonia, the appliances for collecting which at Felling have hitherto been imperfect, will be increased considerably. There is also obtained, per ton of coal treated, from 12,000 to 15,000 cubic feet of combustible gases. The coke obtained is fully equal, both in quantity and in quality, to that obtained by coking the same kind of coal in the ordinary way. The cost of applying the system to existing coke-ovens does not exceed £30 per oven. Licences for applying it to 100,000 tons of coal per annum have already been applied for, and there is every prospect that its application will extend very rapidly.

While during the last few months ammonia has thus begun to be collected from English coke-ovens, it has also begun to be collected from Scotch blast-furnaces. In Scotland, there are some handred and twenty blast-furnaces which are worked with raw coal. Some months ago a member of the firm of William Baird and Co., who happens to be also a director of a gaswork, Mr. William Ferrie, was struck by the idea that the methods employed for separating ammonia and tar from crude illuminating gas might be used for separating the same bodies from the gases from blast-furnaces in which raw coal is used; and although the volume of the gases from such furnaces, per ton of coal employed, is about thirteen times greater than that of the gases obtained by distilling the same kind of coal in retorts—is not less, that is to say, than 130,000 cubic feet—Mr. Ferrie's idea has been put into execution with complete success. From two of the sixteen blast-furnaces at the Gartsherrie Ironworks ammonia and tar have been regularly collected for some months past, and preparations are in progress for collecting them from the other fourteen blast-furnaces there. The quantity of ammonia at present being obtained at Gartsherrie is the quantity corresponding to about 18 cwt. of ammonium sulphate per day, being at the rate of 20 lb. of ammonium sulphate per ton of coal consumed. The other products condensed from the blast-furnace gases have more resemblance to ordinary gas-tar than the corresponding products obtained from the Felling coke-ovens. They are products of the distillation of coal at a temperature intermediate between the temperature at which distillation goes on in those coke-ovens and the temperature at which it is performed in gasworks; and, though the value of the blast-furnace tar has not yet been fully ascertained, it is believed to be nearly as valuable as ordinary gas-tar, though not quite. The results thus obtained at Gartsherrie have led to endeavours at other Scotch ironworks to accomplish the same object in other ways; and experiments to this end are in progress at the Monkland Ironworks, the Summerlee Ironworks, the Airdrie Ironworks, and others; so that we may fairly expect that the time is not far distant when all the ammonia and all the tar which are evolved from Scotch blast-furnaces will be collected and sent into the market.

Each of these one hundred and twenty Scotch blast-furnaces consumes, on an average, 50 tons of coal per twenty-four hours. The total quantity of coal consumed in them per annum is thus $50 \times 120 \times 365 = 2{,}190{,}000$ tons. The quantity of ammonia yielded per ton of coal being, as I have said, the quantity corresponding to 20 pounds of ammonium sulphate, there can thus be obtained per annum from these one hundred and twenty blast-furnaces a quantity of ammonia corresponding to nearly 20,000 tons of ammonium sulphate, worth, at the present selling price of that commodity, not less than £400,000.

Large, however, as is this quantity, it is only one-tenth of the further quantity which can be obtained from English coke-ovens. The quantity of coal coked annually in England is not far short of 20,000,000 tons, and if Mr. Jameson's system were applied to the whole of our coke-ovens, with the result of collecting, per ton of coal treated, the same quantity of ammonia as is obtained from the Gartsherrie blast furnaces, there would be obtained from this source per annum the quantity of ammonia corresponding to 180,000 tons of ammonium sulphate, at present worth more than three and a half millions sterling. Nor is even this all; for I shall have to speak in a moment of another possible, and I believe probable, source of ammonia, even more extensive still.

Now, of the ammonia employed by the ammonia soda maker, he loses from one-fiftieth to one-fortieth part. As he has to employ from one and a half to one and three-quarter equivalents of ammonia for each equivalent of sodium carbonate finally obtained, we may take it that he loses about one twenty-third of an equivalent of ammonia for each equivalent of sodium carbonate manufactured. In terms of ammonium sulphate, being the terms in which the loss of ammonia in the ammonia soda process is usually stated, this loss corresponds to about five and a half parts of ammonium sulphate per hundred parts of sodium carbonate produced. The total annual loss of

* Not, however, I find, to any considerable extent. The only system of collecting ammonia from coke-ovens which is in use in France is the Carvés system, and that is in use only in three works—at Tamaris, at Terre Noire, and at Bességes. The total quantity of coke produced in Carvés ovens in France is 300 tons per day, and the total quantity of volatile products condensed from these ovens per day consists of 6 tons of tar and ammonia equal to from 2 to 2½ tons of ammonium sulphate. The coal used in the works in question is much less nitrogenous than ordinary English coal.

ammonia in the manufacture of the 163,000 tons of ammonia soda now being produced per annum thus corresponds to just about 9000 tons of ammonium sulphate. This is, no doubt, a large quantity of a commodity worth £20 per ton; but, in comparison with the extent of the new sources of ammonia which have just begun to be turned to account, it is utterly insignificant. It is less than one-twentieth part of the quantity capable of being yielded by blast-furnaces and coke-ovens in Great Britain alone, and is a smaller fraction still of the quantity which, I believe, can be obtained from another source which has yet to be mentioned. We may, therefore, be quite certain that the progress of the ammonia soda process will not be hindered or limited by any difficulty as regards supply of ammonia.

(*To be continued.*)

CHEMISTS' ASSISTANTS' ASSOCIATION.

The first paper for the second half-session 1882–83 of this Association was read on Wednesday evening, January 17, by the President, Mr. W. A. Wrenn, entitled "Half an hour with the Plants used in Perfumery." The chair was occupied by the Vice-President, Mr. C. Parkinson.

In his opening remarks Mr. Wrenn alluded to the controversy which has existed as to the propriety of pharmacists to engage in the manufacture and retailing of perfumes and toilet essences, or whether it would be more advantageous (the matter of £ *s. d.* excepted) to leave the sale to the perfumer proper. The flowers and fruits yielding essential oils most prominently mentioned were bergamotte, cloves, jasmin, lavender, narcissus, orange, pelargonium, rose, tuberose and violet. When referring to the oil distilled from the fruit of *Citrus Bergamia*, Mr. Wrenn exhibited some crystals obtained from the following mixture, which had been allowed to remain for two months, with occasional agitation.

Take—

Ess. bergamotte . . .	40	cubic centimetres.
Spirits of wine . . .	5	,,
Acid nitric (sp. gr. 1·200)	10	,,
Water	45	,,

The crystals were said to resemble those of terpin hydrate as obtained by Mr. R. H. Parker from turpentine, detailed in a paper read before the British Pharmaceutical Conference last year. Reference was also made to substances used in perfumery, such as musk, ambergris, etc. In the preparation of essence of musk the author recommended the addition of a small quantity of acetic acid to prevent the accumulation of ammoniacal gas. The use of benzoic acid in cases in which essences were not made from French pomades was noted as increasing the lasting fragrance of the perfume.

The paper, which was profusely illustrated by samples of pomades, essential oils, flowers, etc., kindly supplied by numerous well-known Grasse perfumers and their London representatives, was listened to by a full complement of members and visitors.

A lengthy discussion followed, in which Messrs. Alcock, Braithwaite, Glen, Millhouse, Palmer, Parkinson, Wyatt, and others took part.

A vote of thanks to the President, proposed by Mr. Sangster, and seconded by Mr. Cooke, brought the meeting to a termination.

ROYAL INSTITUTION.

The Primæval Ancestors of Existing Vegetation and their Bearing on the Doctrine of Evolution.

BY PROFESSOR C. W. WILLIAMSON.

The third lecture of this course was delivered on Tuesday last. The following is an abstract:—

The living Equisetums constitute a very distinct group, the members of which exhibit very slight variations from a common type, either of appearance or of organization. The British species vary in height from 1 to 5 or 6 feet, but some South American forms are as much 20 feet in height; but even these tallest examples rarely attain an inch in diameter. The most conspicuous external characteristic of the order is seen in the leaves. These spring from each node of the stem or branch in verticels, in each of which the bases of the leaves are coalesced for fully half their length from a cylindrical sheath. In most of the species branches are also given off from the nodes. Turning to their internal organization, we find that in the Equisetaceous stem the vascular element is reduced to a lower condition than in any other of the vascular Cryptogams. The pith is usually hollow at its centre, whilst at its periphery it is perforated by a ring of vertical canals, which branch at each node, so that those of each internode are vertically intermediate to those of the respective nodes above and below. This alteration in the position of these internodal canals is important, since it reappears in the most ancient fossil forms. Immediately external to each canal we find a very small number of scalariform vessels, the sole representatives of the developed vascular zones of the higher plants. In British forms we usually have but one or two such vessels at each of the outer angles of the canal. In some South American forms these vascular bundles are rather more developed, but are always insignificant. Externally to this ring of vascular bundles is an ample bark enclosed within an epidermal layer, which is more or less silicified.

The reproductive system of the Equisetums is very distinctive of the order. The spore-bearing structures are often at the upper extremities of each of the stems indiscriminately. In some species they are only found on specialized branchless stems. In every case the fruit is a strobilus or cone, in which the several verticels of leaves are peculiarly modified. Each leaf of each verticel stands out at right angles from the central stem or axis, and terminates in a flattened shield-like expansion, from the margin of the inner surface of which there projects yet more internally a ring of cellular bags, or "*Sporangia*." Each of these bags is filled with small spores of very distinctive forms. Each spore has four radiating arms, with club-shaped extremities. When unripe these arms closely embrace the central spore. When ripe, they uncoil themselves, and thus, occupying more space, they burst the walls of the enclosing *Sporangium* and make their escape. Each spore when germinating develops a small branching *Prothallus*. These Prothalli are usually diœcious; the smaller ones bearing *Antheridia* or male organs, representing pollen sacs, and the larger ones bearing *Archegonia* or female structures. Some few are monœcious, both antheridia and archegonia being found on the same Prothallus. These prothalli develop young *Spongonia* or bud-bearing organs, and then wither. The spongonium then develops into the spore-bearing plant known as the Equisetum.

This modern type of Equisetum seems to have existed from a remote period of the world's history, being found in but slightly modified forms in the Tertiary, Cretaceous, Oolitic and Triassic strata. In the latter bed they attained to much more gigantic dimensions than is reached by any living forms, both as regards height and diameter. On reaching the Carboniferous strata we leave behind us the true Equisetums which are now represented by the grander forms known as Calamites, but in the rhœtic and triassic beds, between the base of the Oolites and the Peruvian and Carboniferous strata, we find a genus Schizoneura, intermediate in some respects between the Equisetums and the Calamites. In its young state it has the coalesced sheathing verticles of leaves of the Equisetums; but at an early age each verticellate sheath spilts longitudinally into two or more free leaves, approaching the verticels of free leaves, devoid of sheaths, characteristic of the foliage of the Calamites.

This latter genus assumed an aborescent form both in its growth and organization. We now understand much of its structure, from that of its smallest twigs up to stems of considerable magnitude. That it sometimes

exceeded 30 feet in height is certain, whilst specimens exist which when living must have been from 2 to 3 feet in diameter. The young twigs were purely cellular in structure, but a series of vertical canals, like those of the Equiseta, ran from node to node. Almost simultaneously with the formation of these, woody wedges began to be developed externally to each of these canals and the cellular pith became fistular or hollow, except at such node. Outside the vascular layer was a uniform bark.

In this early state of growth the Calamite seems to have had regular verticels of small branches given off from at least several of its uppermost nodes, which branches have verticels of free, more or less, linear leaves; but it rapidly underwent further changes. Immediately external to the vascular zone was a cambium layer, which added a succession of exogenous growths to that zone, which thus attained to considerable dimensions. A second, more external zone, capable of forming new growths, existed near the outer part of the bark, and which developed a very dense layer of prosenchyma, approaching somewhat closely to the Bast of modern barks. The ordinary Calamites found in sandstones are usually but the inorganic casts of the central cavities of the pith, and may always be recognized by the transverse constrictions at the nodes. These constrictions have no existence, even at the exterior of the vascular zone, still less so outside the Bark. The specimens found in shales also represent similar casts of the pith, invested by a thin layer of coal, which is the sole and insignificant residue of the thick tissues of the pith, wood and bark, nearly the whole of which have disappeared. Most of the verticellate branches also have been arrested in their growth, those that underwent permanent development having an unsymmetrical arrangement, giving the matured stem a very different aspect from that of the young growth.

Many verticellate-leaved plants have been mixed together under the names of *Asterophyllites*, *Annularia*, *Sphenophyllum*, etc. That some of these were leafy branches of Calamites is most certain. Equally so that many of them were not, as is proven by the peculiarities of their internal organization. We have not yet learned to distinguish the true calamitean leaves from what are not calamitean, in the case of those structureless specimens of which the external form alone is preserved. This is also the case with the calamitean fruits. We possess a large number of Strobili under the names of *Volkmannia*, *Bruckmannia*, *Calamastachys* and others, each of which possesses some features in common with those of living Equisetums, and from each of which forms these Equisetums may have derived one or other of their peculiarities; but this portion of the subject will require much further investigation before it will be finally understood. Two things, however, are certain. One is that these most ancient Equisetiform plants had no appendages to their spores corresponding to the elastic club-shaped *Elaters* of the living Equisetums. The other is that some of them were Heterosporous, *i.e.*, possessed both male and female spores like many of the Lycopods and other Cryptogams, which is not the case with any known living Equisetum. The latter are but the degraded representatives of a once magnificent race of forest trees which culminated in the carboniferous age.

Parliamentary and Law Proceedings.

Prosecutions under the 17th Section of the Pharmacy Act.

At the Petty Sessions, Northampton, on Wednesday, January 24, before W. Coulson, Esq. (Mayor), Chairman, and a full bench, Mary Ann Carter, 42, Leicester Road; Alfred Hughes, 49, Bearward Street; Thomas Welford, 11, Upper Mounts, and Thomas Cattell, 34, Wellingborough Road, appeared in answer to a summons charging them for unlawfully selling poison in a packet, the cover of which did not set forth the name and address of the seller of the same.

Mr. Henry Glaisyer, Solicitor, Birmingham, prosecuted on behalf of the Chemists and Druggists' Trade Association of Great Britain. Mr. A. Andrew, Solicitor, Northampton, appeared for the defendant Cattell, the other defendants appeared in person.

Mr. Glaisyer said the summonses had been issued under the 17th section of the Pharmacy Act, 1868, which enacted—"It shall be unlawful to sell any poison either by wholesale or by retail, unless the box, bottle, vessel, wrapper or cover in which such poison is contained be distinctly labelled with the name of the article and the word 'poison,' and with the name and address of the seller of the poison." Mr. Wright came to Northampton on January 16, and visited the shops of the defendants where he purchased one pennyworth of oxalic acid which was labelled "Oxalic Acid—Poison. J. H. Blunt and Son, Wholesale and Retail Druggists, etc., 46, Drapery, Northampton." The defendants had no right to sell oxalic acid or any other poison scheduled under the 17th section of the Pharmacy Act, as they were not registered as chemists and druggists.

Mr. Andrew pleaded guilty on behalf of his client.

The Mayor remarked that oxalic acid was used a good deal in the shoe trade, and informed the defendants that only registered chemists and druggists had a right to sell it.

Mr. Glaisyer said he had brought the defendants there in order that publicity might be given to the law.

A fine of 1s. and costs was inflicted in each case.

Review.

A Dictionary of Medicine, including General Pathology, Therapeutics, Hygiene, etc. By various Writers. Edited by Richard Quain, M.D., F.R.S., etc., etc. London: Longmans. From the Publishers.

It will take a long time to fully appreciate the value of Dr. Quain's 'Dictionary of Medicine.' It stands alone in the great world of literature, and will for many years mark an epoch in the medical literature of the nineteenth century. We do not believe that anything comparable to it has previously existed. It is true that Dr. Copland wrote a dictionary of medicine, whic cost him a life's labour, and as a book for reference it had a large circulation and unquestionably a deserved reputation. When, however, the science of medicine of to-day is compared with what it was when Dr. Copland lived we see what a hopeless task it must be for any man to try to accomplish unaided this truly great work with which Dr. Quain's name is so honourably associated. We find many of the articles are written by Dr. Quain himself, and by his co-workers Dr. Mitchell Bruce and Dr. Roberts, to whom Dr. Quain generously admits in the preface that he is greatly indebted. Yet, the battle has been Dr. Quain's, and he must ever be looked upon as the victorious general who has not only planned, but worked out, even to the minutest detail, the entire work of this herculean and successful literary campaign. It is truly a campaign which has extended over eight years of Dr. Quain's life, and scarcely a day of this somewhat long period of time has passed without something being done towards its accomplishment. It is truly a lasting monument of indefatigable and unwearying labour, and we should not be doing our duty either to the profession which it represents or to its respected and esteemed editor, if we did not preface this notice of the work with words of cordial congratulation. The articles are generally well written, with a terseness and conciseness which is most commendable, though not easily attainable. Some few have apparently been in hand some time, even years, and might with advantage be re-written

for the next edition. In looking over the army of contributors we find the names of men of the highest position in the sphere of medicine and men who are known to do well everything which they undertake to do, and this we maintain is the best guarantee which can be given that their work is well done, not only with regard to the highest scientific truth, but with moral truthfulness, earnestness and sincerity.

There are a hundred and fifty-eight contributors, and among these we find the time-honoured names of James Paget, Erasmus Wilson, Joseph Fayrer, William Jenner, W. B. Carpenter, Murchison, Parkes, Henry Thompson, Spencer Wells and Miss Nightingale. It is curious and important to notice how prominently specialism manifests itself in every page of this work. The specialist who, twenty years ago, was denied and almost tabooed as though he were some impostor or quack, now ranks foremost in the best literary work of our time. We find excellent articles by Mr. Brudenell Carter, "On the Diseases of the Eye and its Appendages;" by Dr. Jones, of New Orleans, "On Yellow Fever;" by Sir Henry Thompson, "On Diseases of the Bladder;" by Dr. Playfair, "On Diseases of the Womb;" by Miss Nightingale, "On Nursing, and the Training of Nurses;" by Mr. Spencer Wells, "On Diseases of the Ovaries;" by Erasmus Wilson, "On Eczema;" by Dr. Roberts, "On Gout;" and by the late Dr. Silver, "On Diabetes." Dr. Grainger Stewart's carefully written article "On Diseases of the Kidneys" is unique, and it is surprising to find that he has been able to treat so important a subject with such thoroughness and completeness in so small a space. We are pleased to find so great an authority advocating local blood-letting and dry cupping in active congestion of kidney, a mode of treatment deserving more attention than is usually admitted by the dreamy and hazy therapeutics of this period. Dr. Wiltshire's contribution "On Blood-letting" deserves attention, and at every point of importance it develops the practical mind of the author. He says:—"It is almost certain (we would say it is quite certain) that in either extreme there is an evil, and that we may have recourse in certain cases to abstraction of blood with some degree of that success which formerly led to its extensive use if not its abuse." The late Dr. Pearson Irvine gave a very interesting article "On the Causes of Disease," and in speaking of heredity as a prolific source of predisposition to disease. he says, "There is amongst men not only an inheritance of such prominent diseases as phthisis, but of peculiarities in the manner they meet and pass through minor ailments. Thus in families with a 'nervous history' we meet with predisposition to headaches of nervous type, irregularities of digestion in the form of diarrhœa and vomiting, and a multitude of conditions which have of late been ascribed to vasco-motor disturbance. The members of some families live long in spite of exposure to almost every exciting source of mischief, and contrast most favourably with others, who, as far as one can determine, have all things in their favour." We quote these observations merely as an indication of the nature of the article. Dr. Bastian writes a short but good article on "Bacteria." It is well known that Dr. Bastian is not a believer in the germ theory of disease, and he even doubts that germs have an essential share in fermentation. He says, "The vital or germ theory of fermentation would be broken down and become untenable whenever it is shown that fermentation can originate independently of the bacteria and their germs, which appear as part of the process. Similarly the germ theory of disease would be refuted if it could be shown that some of the morbid processes in question would originate in the absence of the living organisms which subsequently appear as part of the pathological products. The question of 'spontaneous generation' comes, therefere, to be inextricably mixed up with the question of the truth or falsity of the germ theory of disease, so that the study of the latter, to the neglect of the former, can only end in vagueness and uncertainty." Dr. Lauder Brunton, in his article on tonics, gives a bit of advice which may prove serviceable. He says, "In administering tonics care should be taken to ascertain that the case is suitable, for in very many cases of apparent debility the imperfect functional activity of the body or of its parts does not depend upon insufficient nutrition but upon imperfect removal of the products of waste. The proper treatment in these cases is not to give tonics but to remove the waste products by cholagogues, purgatives and diuretics." All the articles "On Nervous Diseases" are well written, but we would draw the special attention of our readers to the very valuable contribution "On Epilepsy," by Dr. Brown-Séquard, and "On Epileptic Insanity," by Dr. M. G. Echeverria, and at the same time we must admit that we regret not to find the respected name of Hughlings-Jackson amongst this class of contributors. Dr. Green gives an exhaustive article on "Pneumonia," and Dr. Powell and Dr. Williams deal with the subject, of "Phthisis. Dr. Gee writes on "Tubercles." Sir James Paget has something to say upon his old love "Pathology." Sir William Jenner writes upon one of his favourite themes, "Deformities of the Chest." Dr. Broadbent writes upon "Fevers," treating the subject with the authority of experience, and he does not fail to remind us that quinine and salicylic acid are valuable therapeutic agents to reduce temperature. Mr. Simon writes on "Contagion," and Dr. Southey "On Personal Health;" both of these articles must be of great interest to those engaged in the study of "Preventive Medicine." It will be a grand day for science and a day of comfort and happiness to living beings in general when the generation and propagation of disease germs can be snuffed out of existence and when health shall reign supreme. It need scarcely be said that this day has not arrived, but the future lies before us and who is there bold enough to predict what shall or what shall not come to pass? To attempt anything like a review of this Dictionary is as impossible as it would be out of place in the columns of this Journal, but the work is one which could not be passed by without some notice and we do hope that sufficient has been said of it to commend it to the highest consideration of our readers.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Permanganate of Potash Pills.

Sir,—As permanganate of potash pills seem to be attracting some attention and no one has as yet suggested the method which has appeared to me best, I venture upon offering you a few lines which I extract from notes for the next edition of my 'Pharmacy.'

"There are a few chemicals occasionally prescribed in pills which are more or less subject to decomposition by contact with organic matters; the silver salts may be taken as common examples and permanganate of potash as an extreme case of this kind. The latter body is best made up with China clay and water.

"No. 27.

"℞ Potassæ Permangan. . . . . gr. xxiv.

"Ft. pil. xii.

"Add China clay in powder, 36 grains; water, 18 dropss

"A good pilular mass is thus obtained which keeps it. physical and chemical condition satisfactorily, and disintegrates promptly in water, yielding the permanganate unchanged."

I do not know why any one should add grease to clay when water is all that is required to make it "as plastic as clay," and the absence of organic matter is desirable.

Newcastle. Barnard S. Proctor.

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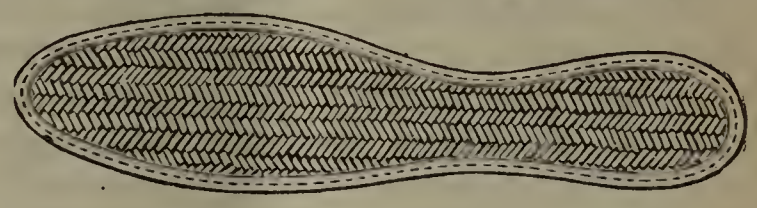

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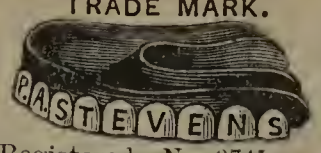

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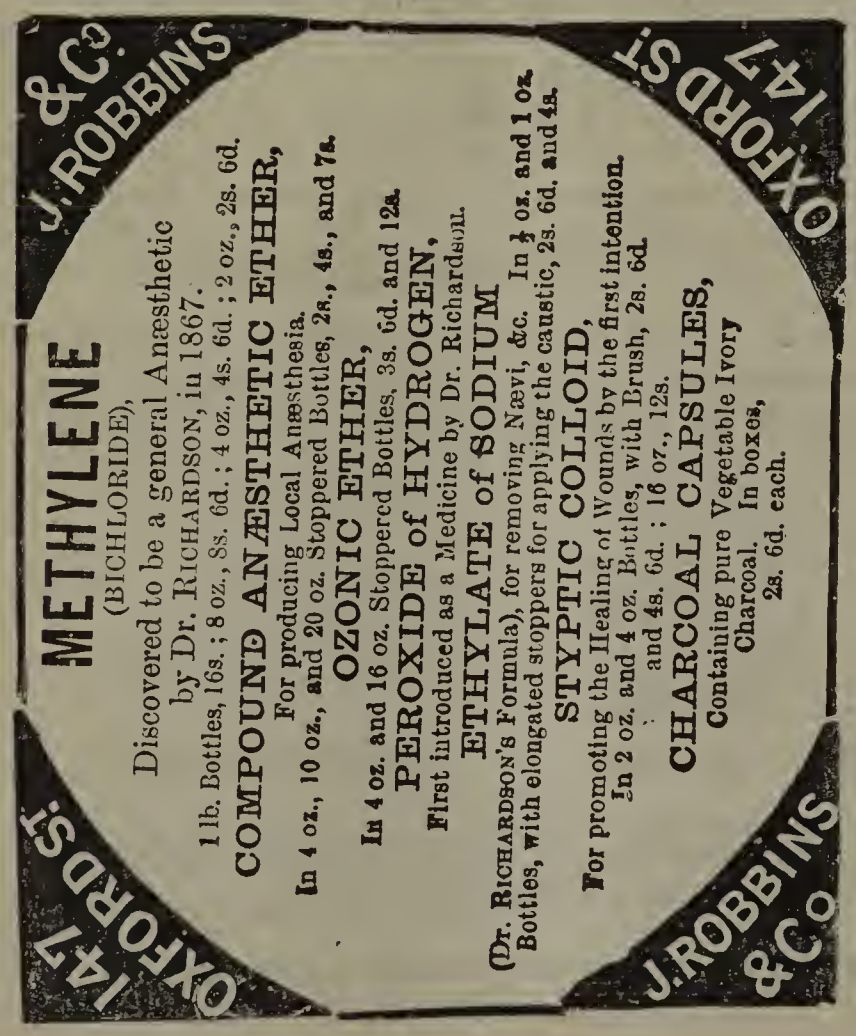

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We strongly recommend our Aperient Pills at 6s. and Compound Rhubarb at 7s. per pound, coated, as saleable Pills. These, or any Pills in our list, are sent out to every part of the United Kingdom in half-pound parcels, package, postage, and carriage free, on the same day as the order is received; and, to avoid booking and other expenses, 1d. in the Shilling will be allowed if stamps or P.O.O. are remitted with order.

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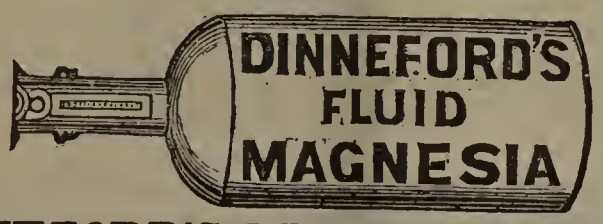

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„ „ June „ 10 „

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LOCUM TENENS.—A gentleman (Ph. Chemist) of good address and long experience, seeks an engagement during absence, &c. Town or country. Highest references. MEDICUS, 3, Blomfield Ter., Paddington, W.

AS ASSISTANT, for about two months. Minor qualification. Age 23. Height 5ft. 9in. Town and country experience. Good references. Disengaged. CORTEX, 35, Alfred Pl., Tottenham Court Rd., W.

AS ASSISTANT. In London. In good Dispensing business. Age 23. Height 5ft. 8in. Good references. H. A., 19, Grove Rd., Holloway, N.

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ENGAGEMENTS WANTED.

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AS Assistant or Surgeon's Dispenser. London or suburbs preferred. 6 years' experience. 14 months in a busy Surgery in London. P., 16, Maysoule Rd., Clapham Junction.

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AS Assistant. London or the Midland Counties, but London preferred. Ætat. 22. Height 5ft. 10in. Good references. Cortex, 140, Woodborough Rd., Nottingham.

AS Improver. Age 19. Height 5ft. 4in. Salary no object where a comfortable home and thorough knowledge of the business could be had. J. B., Bridge St., South Stockton.

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FOR the Wholesale.—A young man, aged 20, having had 5 years' experience in good Retail, is desirous of entering the Wholesale. W. Piek, Cutting & Son, Chemists, Selby, Yorks.

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ASSISTANTS WANTED.

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TRAVELLER.—A gentleman, representing one or two good Firms, to undertake the Sale on Commission, or otherwise, of first-class Specialities, already in large demand. Address, Lancaster, "Chemist and Druggist" Office, 44a, Cannon St., E.C.

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The Pharmaceutical Journal AND Transactions.

THIRD SERIES, No. 659.] SATURDAY, FEBRUARY 10, 1883. [PRICE FOURPENCE.

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Pharmaceutical Society of Great Britain,

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FOR 1883.

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Pharmaceutical Journal

ON FEBRUARY 24, 1883.

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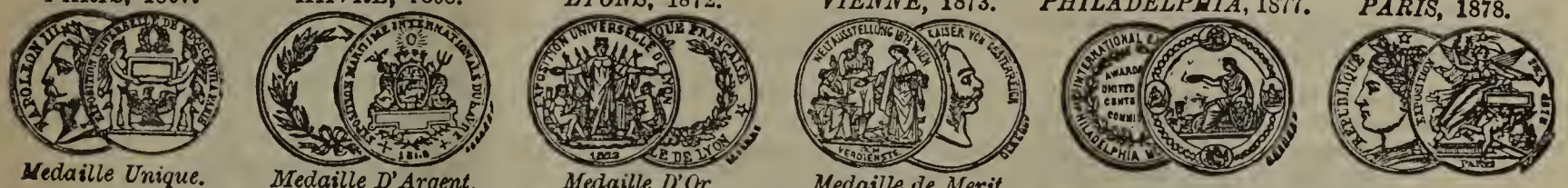

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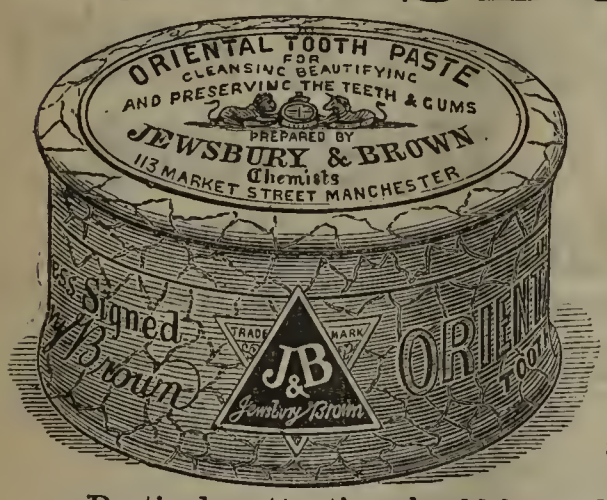

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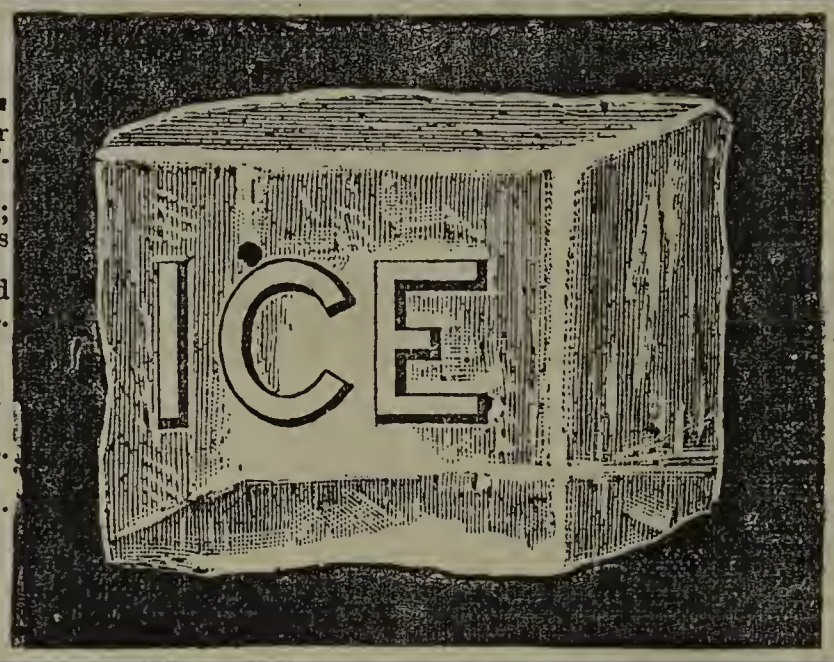

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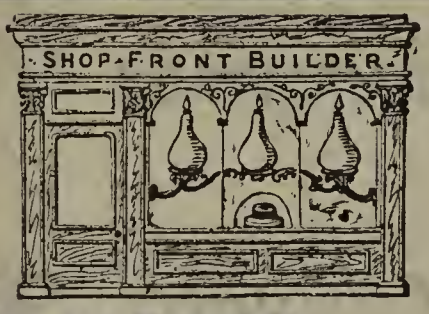

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"New York Medical Journal," *August* 1880,
Dr. F. Weir,
in Lecture delivered to the College of Physicians and Surgeons, New York.

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A RESEARCH ON THE ALKALOID GELSEMINE AND SOME OF ITS CRYSTALLINE SALTS.*

BY A. W. GERRARD, F.C.S.

The alkaloid under notice is yielded by the *Gelseminum sempervirens*, or Carolina jasmine. The natural order of the plant is doubtful, being placed by De Candolle in the Loganiacæ, by Decaisne in the Apocynaceæ. The drug found its way into regular medical practice through the eclectics, and is now official in the United States Pharmacopœia.

In this country it has attained a good reputation for the treatment of toothache and neuralgia. The part of the plant used is the root, from which are prepared a tincture and liquid extract, also a resin called gelsemin. A detailed account of the history, characters and composition of the plant will be found in a valuable paper by E. M. Holmes, in the *Pharmaceutical Journal*, December 18, 1875.

The first communication within my knowledge, having reference to the chemical constituents of gelseminum root, was contributed by Kollock to the *American Journal of Pharmacy*, 1855, p. 203, the principal facts elucidated being, that it contained gelseminia, dry resin, volatile oil, fatty resin and a yellow colouring matter. This was followed in 1869, with a paper by Eberle, who examined the woody portion of the root for alkaloid, and states, "The wood of the root can be safely asserted, from careful experiment, to be free from alkaloid." This observation I have corroborated. In 1870 an important addition was made to our knowledge of its constituents by Dr. Wormley, who discovered the presence of an interesting highly fluorescent body, which he named gelseminic acid. At the same time he described the physical characters and chemical reactions of the alkaloid gelsemine.

In 1876 Professor Sonnenschein communicated to the *Berichte d. deutschen Gesellschaft, Jahr.* ix., the results of analyses of gelseminic acid and the alkaloid gelsemine. For the alkaloid was found the formula $C_{11}H_{19}NO_2$, and for its hydrochloride $(C_{11}H_{19}NO_2)_2HCl$. No simple crystalline salts were obtained by either Sonnenschein or Wormley. For gelseminic acid Sonnenschein gave the formula $C_{30}H_{34}O_{19}$ and claimed its identity with esculin. This claim has since been controverted by Wormley.

Five years ago, I prepared some gelsemine for physiological use, and particularly noticed that the published processes for its extraction did not yield a product that could be called pure, as it was more or less coloured yellow or brown. I also observed that traces of gelseminic acid persistently adhered to the alkaloid, as evidenced by the fluorescence of the latter in the presence of alkalies. At this time I was strongly impressed with the above defects, and doubted not that if gelseminia could be obtained in a sufficient state of purity (possessed as it is of such strongly basic characters) its salts could be made to crystallize. The small quantity of alkaloid at my command did not admit of many experiments, and these were without result. Later on, I prepared the alkaloid in small quantity, and obtained one of its salts in microscopic crystals, sufficiently well defined to determine me to make an investigation on a larger portion of material. I am now able to state I have prepared in the crystalline form the pure alkaloid and a number of its salts.

Method of Extraction.—Twelve kilogrammes of well-powdered root were exhausted with alcohol, which left after distillation 1703 grams of soft extract. The extract, on resting, separated into two strata.

The superstratum, green in colour and having the appearance of an oleo-resin, was removed and found to be practically insoluble in water; it was well shaken with dilute hydrochloric acid to remove traces of adhering alkaloid, and the acid solution mixed with the substratum. The substratum, containing the alkaloid, was diluted with water until it ceased to precipitate resin, and left a clear bright brown solution, which was evaporated at a temperature below 60° C., treated with ammonia in excess and thoroughly washed with ether. The ether solution, now containing the gelsemine and beautifully fluorescent from the presence of gelseminic acid, was decanted and exposed a short time to allow excess of ammonia to escape. Hydrochloric acid was next added in fractions with agitation until the fluorescence was destroyed, a certain indication that the whole of the alkaloid had been removed from the ether. The hydrochloride of gelsemine had now separated from the ether, forming a layer of pale yellow amorphous precipitate, which upon separation was subjected to several reconversions, until the last traces of colour and fluorescence had disappeared, the product being 20·2 grams of perfectly white hydrochloride of gelsemine. It may here be mentioned that the pure alkaloid obtained from the hydrochloride by alkali, and chloroform or ether, holds its solvents tenaciously, and requires the heat of a water-bath to effectually remove them. During their removal the gelsemine swells into vesicles which, on cooling, can be easily powdered.

Properties of Gelsemine.—It is a brittle transparent solid, crystallizing with difficulty from alcohol. Boiling water sparingly dissolves it, the solution on cooling becoming faintly turbid from separation of gelsemine. It softens at 38° C. and becomes fused at 45° C. Heated on platinum it ignites, burning with an orange-yellow flame and leaving no trace of residue. Solutions of its salts have a distinctly but not powerfully bitter taste, and give with potash or ammonia white precipitates soluble in excess. If the solution containing excess of ammonia be exposed to the air, as the ammonia is eliminated the gelsemine separates in granular crystals. The pure base gives no colour reaction with strong nitric acid, and the mixture is scarcely changed in colour by heating. Strong sulphuric acid has no apparent reaction upon it; but if to the mixture a little manganic oxide be added and rubbed with a glass rod, a deep crimson red is obtained, passing to green. This reaction is exceedingly delicate, and can be easily shown by dissolving 1 milligramme of pure gelsemine in 10,000 milligrammes of strong sulphuric acid, then adding a few milligrammes of manganic oxide. It can be even demonstrated with a solution of 1 in 100,000. If the preceding reaction is performed upon the pure alkaloid, the colour is sufficiently intense to cause it to be mistaken for strychnia; but if a parallel experiment be carried on with strychnia the two alkaloids cannot

* Read at an Evening Meeting of the Pharmaceutical Society, February 7, 1883.

be mistaken, for the strychnia gives an intense purple, passing to red. Picric acid gives a yellow crystalline precipitate; gold chloride, a yellow amorphous precipitate, soluble in boiling water, separating on cooling, partly in crystals. Platinic chloride gives a yellow precipitate, soluble on boiling.

REACTIONS ASCRIBED TO GELSEMINE.

	Gerrard.	Sonnenschein.	Wormley.
Strong nitric acid . . .	No reaction.	Yellow-green colour.	Brownish-green, changing to deep green colour.
Strong sulphuric acid . .	No reaction.	Yellow-green, passing to reddish-brown colour and upon heating to dark red.	Dissolves with a red or brown colour which after a time assumes a pinkish hue. Warmed it acquires a chocolate or violet colour.
Sulphuric acid and manganic oxide	Gives a damask red colour, passing to green or blue.		
Strong sulphuric acid, and bichromate of potash in crystal . . .	A crimson evanescent redness passing to a green colour.	A cherry-red colour, changing a little to violet, which soon form a bluish-green spot.	Reddish-purple streaks along the path of the crystal.
Gold chloride	Yellow precipitate, soluble when heated.	Yellow precipitate, not altered by heat.	
Platinum chloride . . .	Amorphous yellow precipitate, soluble in water on heating.	Amorphous yellow precipitate, soluble in water on heating.	
Potash mercuric iodide .	White precipitate, which dissolves on heating and separates on cooling.	A white precipitate, which dissolves on heating and separates on cooling.	

The following salts were prepared and obtained in crystals. Hydrochloride, hydrobromide, sulphate and nitrate. The hydrochloride is a moderately soluble salt, separating from water as an apparently amorphous powder, consisting really of small granular crystals. It is sparingly soluble in cold, more soluble in hot alcohol; from the latter it separates slowly in prismatic crystals. The hydrobromide crystallizes more readily from water and alcohol than the hydrochloride, forming prisms. The sulphate and nitrate were freely soluble in water and alcohol, and crystallized indifferently on spontaneous evaporation.

Since the alkaloid I obtained differed in important respects from that experimented upon by others, and was evidently in a higher state of purity, it was thought desirable to submit it and some of its compounds to combustion.

Three determinations of nitrogen were made by the absolute method, from the pure alkaloid, and the following percentages by weight calculated:—7, 7·3 and 6·9.

Four combustions with cupric oxide and copper of quantities varying from ·100 to ·200 gram gave the following percentages of carbon and hydrogen:—

	C.	H.
1.	70·4	7·2
2.	70·1	7·3
3.	70·3	6·9
4.	70·45	7·3

Taking the oxygen by difference these figures admit the construction of the following formula for gelsemine, $C_{12}H_{14}NO_2$, for which theory requires 70·6 C, 6·86 H, 6·86 N, and 15·68 O.

The chlorine was estimated from the hydrochloride, and 8·1 per cent. found, showing the composition of this salt to be $(C_{12}H_{14}NO_2)_2HCl$, which requires 7·96 per cent. chlorine. In like manner, the hydrobromide was found to yield 16·21 per cent. bromine $=(C_{12}H_{14}NO_2)_2HBr$, which requires 16·3 per cent.

The platinum and gold salts of the alkaloid were purified and burnt; the former gave 16·7 per cent. platinum, the latter 36·9 per cent. gold, pointing to a composition for the former of

$$(C_{12}H_{14}NO_2)_4(HCl)_2PtCl_4,$$

for the latter $(C_{12}H_{14}NO_2)_2HCl(AuCl_3)_2$, these requiring respectively 16·4 platinum and 37·4 gold.

The main features of this as differing from previous researches show—(1) that the alkaloid gelsemine can be obtained in a state of purity as a crystalline colourless solid, forming crystalline salts with acids, and giving no colour reactions with nitric or sulphuric acids; (2) that the pure base has the formula $C_{12}H_{14}NO_2$, thus differing greatly from the formula obtained by Sonnenschein, who, it is certain, must have used an impure substance, as shown by the colour reactions his alkaloid gave with nitric and sulphuric acids.

Forensic Note.—In cases of poisoning by gelseminum, where the resin, extract, or tincture have been employed, no difficulty need be experienced in detecting its presence, all these preparations containing gelseminic acid, which imparts its powerful blue fluorescence to any mixture on the addition of an alkali. When the alkaloid gelsemine has to be sought, its isolation can be effected by any of the methods followed for strychnine, especially taking advantage of the fact that gelsemine like strychnine is not destroyed by strong sulphuric acid. After isolation, and showing its alkaline and alkaloidal nature, its most special reaction would be the red colour with sulphuric acid and manganic oxide. These characters alone should scarcely be deemed sufficient evidence of its presence. In addition, its physiological action should be sought and demonstrated; if this be obtained it may be concluded gelsemine is present.

The Physiological Action of Gelsemine. By Dr. G. Rouch.

The results at which I have arrived are somewhat doubtful, so that I submit them without being too positive as to their significance.

If 2 to 5 milligrams of the hydrobromide of gelsemine in aqueous solution are injected into a red frog (*Rana temporaria*) there is observed a slight shaking and some manifestations of excitability which pass frequently unperceived; there is a notable loss of vivacity and the animal does not jump so easily; placed on his back he turns himself over with difficulty and is not long before he remains completely torpid. This condition, which begins ten to fifteen minutes after the injection, is about complete in half an hour.

The difficult respiration set up on the administration of the drug becomes speedily normal in all cases where the dose has been a weak one; nevertheless it may continue for a long time, especially as regards the hyoidiene region. In the particular case to which I refer, I cannot estimate it, a portion of the dose having been spilt. When the movements have quite disappeared the posterior limbs quite relaxed are drawn towards the body, but the anterior limbs are in a peculiar position. They are sometimes in the form of a bow, and crossed under the sternum, thus lifting the anterior region; occasionally they are divergent on the sides of the body, the forearms bent at right angles on the arms, and the hands resting on the ground. They keep this position whatever may be the posture given to the animal, and in the first case if he is turned on his back they form a bow into which the finger can be introduced and the animal lifted. The animal may die in this position after several hours, or the next day, the heart being the last to stop. If the dose is weak this state may last several days.

From the beginning the frog seems to have lost voluntary power, it remains completely inert, but the reflex movements are kept up longer, the contact of a corrosive liquid producing co-ordinate movements which end subsequently to the complete paralysis.

The above results do not change if one of the posterior limbs is preserved by the ligature of the iliac artery, the two members lose their reaction equally, and on the other hand the electric excitability of an induced current, even very feeble, on the sciatic nerves, produces tetanus of equal intensity on both sides, and this happens several hours after the complete paralysis, whilst the heart has almost stopped. This would lead us to conclude that the hydrobromate of gelsemine has a paralysing action on the excito-motor centres.

In experimenting on the green frog (*Rana esculenta*) I observed quite different toxic manifestations. As I have not been able to repeat these experiments I shall give them with reserve.

After toxic effects almost similar to those I have described in the case of the red frog,—less violent, however, and with greater allowance made for the medullary hyperexcitability,—I found two days after injection the animal breathing in the position described above, lifted up by the anterior limbs crossed in a circle under the sternum, but different from what I had seen before by a notable reflex hyperexcitability. A blow on the vessel which contained it produced a tetanic extension of the posterior limbs, the two limbs parting forcibly in complete extension, the fingers like a fan, sometimes simultaneously, sometimes one after the other, but diverging and not approaching the middle line as with strychnine. These manifestations resemble rather the symptoms of picrotoxin, or the beginning of the intoxication by brucia. These tetanic contractions are of very short duration, but are unique for each excitation and rarely spontaneous. The tetanus can be reproduced by a shock of the vessel; a blow on the table would not be sufficient. Occasionally the animal utters a little cry. These symptoms lasted three days, improving gradually until they had completely disappeared, and the animal executed voluntary movements which allowed it to escape.

One can only be astonished at such a different action. The dose stands for nothing in the present case, for I have kept a red frog slightly intoxicated which did not give similar phenomena, any more than others which had received considerable doses. I am thus brought to admit there is a different susceptibility in the two species of frogs. The experiments of Messrs. Prevost and Wintzmie on brucia had led them to analogous results, although inversely.

I should have liked to have analysed all these toxic manifestations and to have defined more clearly what belongs to different parts of the nervous system. I would also have liked to repeat my researches on warm-blooded animals; but I have sacrificed what I had left of the gelsemine on a guinea pig, without result. I prefer, then, to leave the facts which I have thus crudely demonstrated to be decided by a future study.

Paris, January, 1883.

Action on the Eye. By Prof. J. Tweedy, F.R.C.S.

Though less irritating and more prompt in its action than the earlier preparations, I could not in any case with the crystallized gelsemine obtain distinct paralysis of accommodation such as follows the instillation of a solution of atropine. As with the earlier preparations, I found the dilations of the pupil preceded by a brief contraction stage, accompanied with a zone of ciliary injection. The contraction and ciliary injection passed away with equal steps.

COMPLETE EXHAUSTION OF NUX VOMICA.*

BY R. ROTHER.

Tincture of nux vomica is an important and useful preparation, and by virtue of its active principles a very powerful one. Definiteness in its construction should therefore be one of its prime features. It is questionable whether the primitive method at present in use really secures a saturated solution. Neither the strychnine or the other alkaloids are free, since the great excess of igasuric acid insures compounds which, although soluble in alcohol, are but sparingly soluble in water. Now, by reason of a peculiar gummy substance contained in nux vomica, insoluble in alcohol, in which the alkaloidal compounds are imbedded, alcohol can only exert a surface action, and hence will be effective in a measure in proportion to the fineness of the powder. Although water or weak alcohol softens and permeates the horny body, either of them fails to extract the now sparingly soluble igasurates. It is therefore evident that nux vomica cannot be exhausted by any form of alcohol. Acidulated alcoholic menstrua

* From the *American Journal of Pharmacy*, January, 1833.

are equally powerless, because igasurates, like tannates of the alkaloids, are indecomposable by weak acids.

Seeing that the gummy matter is the chief obstacle to exhaustion, the writer sought to decompose it, in a preliminary operation, by means of dilute sulphuric acid. Failing with this, ammonia was tried with a little success; but having accidentally added some borax to the ammoniacal mixture a rapid coagulation was noticed. Upon this, powdered nux vomica was mixed with borax and percolated with a menstruum composed of equal measures of alcohol and water, and, although absolute exhaustion of the powder was readily achieved, the percolate possessed such an obstinate turbidity that the process, otherwise so satisfactory, was yet a failure. Boric acid, applied in a similar manner, was as inefficient as other acids previously tried. It was next resolved to test potassium citrate, which insured a satisfactory product, and absolute extraction of the drug. Deeming a simpler saline body more appropriate and obtainable, the writer resorted to sodium chloride, and attained, above all others, the most perfect result.

It is remarkable what a solvent action a saline substance has on the active constituents of nux vomica; the horny matter is speedily softened, permeated and extracted without becoming in the least mucilaginous or distended. The weak alcoholic saline menstruum percolates the powder with such freedom that this must be very firmly packed, and the flow of the percolate further regulated with appropriate checks. The thorough exhaustion is effected, in all probability, by reason of a double decomposition occurring between the igasurates and the sodium chloride in the presence of weak alcohol, resulting in the generation of strychnium chloride, brucium chloride and sodium igasurate, all of which being very soluble in diluted alcohol. When this solution is diluted with water a retrograde decomposition sets in, the igasurates of the alkaloids are precipitated, and sodium chloride remains in solution.

From a consideration of the above cited results the following facile formula for an absolutely representative tincture of nux vomica is obtained.

Take of—Nux vomica, in fine powder . . 8 troy ounces.
Sodium chloride . . . . . 6 drachms.
Alcohol,
Water . . . . . of each 1½ pint.

Dissolve the sodium chloride in the water; then add the alcohol, and mix them. Upon two troy ounces of the nux vomica, contained in a large capsule, pour two fluid ounces of the menstruum, and mix them by means of a pestle; then gradually add the remainder of the nux vomica, and thoroughly mix the whole as before. Pack this mixture very firmly into a cylindrical glass percolator, and pour on of the menstruum little by little until, in the course of six to eight hours, the liquid has descended to the bottom of the column. Now suspend the operation, and after twelve hours pour on more of the menstruum, and regulate the flow at the exit so that after twenty-four hours two pints of percolate may be obtained. To avoid a trace of turbidity, which is liable to appear in the first fluid ounce of percolate when the menstruum is added too rapidly at first, 1½ drachm of the sodium chloride may be mixed with the nux vomica before packing, and the remainder dissolved as before. The finished tincture contains ¼ grain of sodium chloride in 15 minims.

DELPHINIUM AJACIS.

From experiments with acetic and aqueous infusion of the larkspur, Dr. Benvenuti draws the following conclusions:—The flowers of the *Delphinium Ajacis* possess an insecticide action, and are to be preferred to other remedies of similar action on account of cheapness and absence of smell. They have a marked anæsthetic action, are excitant, rubefacient, astringent and antizymotic. Dr. Benvenuti thinks this remedy has many points of resemblance to carbolic acid and iodoform.—*Louisville Med. News.*

A BILL

INTITULED AN ACT TO REGULATE SALES OF POISONOUS ARTICLES, ALSO TO FURTHER REGULATE THE SALE OF POISONS AND ALSO TO ALTER AND AMEND THE PHARMACY ACT, 1852, AND THE ACTS AMENDING THE SAME.

Preamble.—Whereas it is expedient for the safety of the public that sales of poisonous articles should be regulated, also that any seller or keeper of an open shop for the retailing, dispensing or compounding of poisons and medical prescriptions should possess a competent skilled knowledge, and also that sales of poisons should be further regulated. And for the purposes aforesaid or some of them it is expedient that the provisions contained in the Act passed in the 15th and 16th years of the reign of Her present Majesty intituled an Act for regulating the qualification of Pharmaceutical Chemists, hereinafter described as the Pharmacy Act, 1852, and in the Acts amending the same, should be amended, Be it enacted by the Queen's Most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal and Commons in this present Parliament assembled, and by authority of the same, as follows:—

1. *Definition Clause.*—Words importing the singular number only shall include the plural number.

2. *Regulations to be observed in the Sale of Poisonous Articles.*—It shall be unlawful to sell by retail any poisonous article for the time being in the Schedule of poisonous articles hereto, unless the box, bottle, vessel, wrapper or cover in which the same is contained be distinctly labelled with the name of such poisonous article and the word "poisonous," and with the name and address of the seller thereof. And the Council of the Pharmaceutical Society of Great Britain may, from time to time, declare by resolution that any article ought to be added to the said Schedule of poisonous articles, and shall submit the said resolution for the approval of the Privy Council. And if such approval shall be given such resolution and approval shall be advertised in the *London Gazette*, and on the expiration of one month from the advertisement any article named in any such resolution shall be deemed to be added to the said Schedule.

3. *Regulations on Sales by wholesale of Poisons in Part 1 of Schedule A. to the Pharmacy Act*, 1868.—Notwithstanding any exception or thing in section 17 of the Pharmacy Act, 1868, contained, every seller by wholesale of any poison for the time being in the first part of Schedule A. to the Pharmacy Act, 1868, shall keep a record in writing of the name of such poison, the quantity sold, the name and address of the purchaser, and the date of the sale, and shall preserve such record for twelve calendar months.

4. *Labelling of Patent Medicines being or containing a Poison.*—It shall be unlawful to sell by wholesale or by retail any patent medicine or any article bearing a patent medicine stamp (herein comprised in the words patent medicine), being or containing a poison within the meaning of the Pharmacy Act, 1868, unless the box, bottle, package or vessel in which the same is contained, the wrapper, if there be only one, or the outermost wrapper if there be more than one, be labelled with the name and

address of the first seller of the same, the name of the patent medicine and the word "poison."

5. *Penalties for certain Offences.*—Any seller acting in contravention of either of the preceding sections shall, upon a summary conviction before two justices of the peace in England or the sheriff in Scotland, be liable to a penalty not exceeding £5 for the first offence, and to a penalty not exceeding £10 for the second or any subsequent offence.

6. *Duly Qualified Keepers of Open Shops Entitled to Remedies in certain Cases.*—In case a duly qualified keeper of an open shop for the sale of poisons is exposed to a penalty in respect of a sale by retail of a patent medicine not prepared for sale by him by reason of the box, bottle, package, vessel, or wrapper in which the same is contained not having been duly labelled in the manner hereinbefore provided, he shall, after having paid the same, be entitled to be indemnified in respect of the same, and any costs properly incurred by him in relation to the offence or conviction, or his defence thereto, by the owner of the said patent medicine, or by any intermediate seller of the same, and every intermediate seller shall be entitled to be indemnified over by the first seller of the said patent medicine, or any intermediate seller of the same: provided always that in claiming such indemnity the seller must prove that he purchased the said patent medicine not knowing it to be otherwise than properly labelled, and sold it in the same state in which he purchased it, and any seller or owner from whom such indemnity is claimed may prove that the conviction was wrongful, or that the amount of costs awarded or claimed was unreasonable.

7. *Persons Keeping Open Shops to be liable for their Assistants, Apprentices and Servants.*—All the provisions of the Pharmacy Act, 1868, which apply to sales of poisons, and all the provisions of this Act which apply to sales of poisonous articles, or to sales of poisons whether as patent medicines or otherwise, or to medicines compounded from medical prescriptions, shall be deemed and taken to apply to any seller on whose behalf any sale is made by any assistant, apprentice or servant, and such assistant, apprentice or servant shall be deemed to be the agent of the seller on whose behalf any such sale is made.

8. *Regulation for Conducting Branch Businesses.*—It shall be unlawful for a duly qualified keeper of an open shop for retailing, dispensing or compounding medical prescriptions or poisons to keep open shop in more places than one, unless he shall engage and employ at each branch shop a person who would himself be a duly qualified keeper of an open shop for retailing, dispensing or compounding medical prescriptions or poisons, and such person is *bonâ fide* occupied in such branch shop, provided always that each partner in a duly qualified partnership may keep a separate open shop for retailing, dispensing or compounding medical prescriptions or poisons.

9. *Duly Qualified Persons to sell Medical Prescriptions and sell Poisons.*—It shall be unlawful to sell by retail, or to keep open shop for retailing, dispensing or compounding medical prescriptions or (whether as patent medicines or otherwise) poisons within the meaning of the Pharmacy Act, 1868, and any Act amending the same, unless the seller and the keeper of any such open shop be a pharmaceutical chemist, or chemist and druggist, or a medical practitioner entitled to and acting within the exemption concerning certain medical practitioners made by section 1 of "The Pharmacy Act (1868) Amendment Act, 1869," or entitled to and acting within the exemption concerning certain executors, administrators and trustees made by section 16 of the Pharmacy Act, 1868, provided, nevertheless, that nothing in this section contained shall extend to or interfere with the business of wholesale dealing in patent medicines, nor with the business of wholesale dealers in selling poisons in the ordinary course of wholesale dealing, or of any member of the Royal College of Veterinary Surgeons of Great Britain, or person holding a certificate in Veterinary Surgery from the Highland and Agricultural Society in Scotland, or whose name appears on the Register of "existing practitioners" under the Veterinary Surgeons Act, 1881, in dispensing medicines for animals under his care.

10. *Persons keeping Open Shop must, on Application, Inform the Registrar of the Name or Names of Proprietor or Proprietors, and Penalty for Non-Compliance.*—The Registrar of the Pharmaceutical Society of Great Britain may, at any time, and from time to time deliver, or cause to be delivered to the seller or the keeper of any open shop for the retailing, dispensing, or compounding of medical prescriptions or poisons, or at any shop purporting to be the shop of a pharmaceutical chemist, or pharmaceutist, or chemist and druggist, or chemist, or druggist, or whereat there shall be assumed, used, or exhibited any name, title, or sign implying that it is the shop of a person registered under the Pharmacy Act, 1852, or the Pharmacy Act, 1868, a notice signed by him requiring delivery to him within seven days thereof of a statement in writing of the name and address of such seller, or the keeper of such shop, and of his qualification so to sell or to keep such shop, and thereupon such seller or the keeper of such shop shall, within such seven days, cause to be delivered to the said Registrar a statement accordingly, and in default thereof, every such seller or keeper of such shop shall be liable to a penalty of £5 for each day so long as such default shall continue, and every person afterwards, during continuance of the default, found selling poison at, or compounding medical prescriptions at, or acting in the management of the business at such shop shall be liable to a penalty of £5 for each such offence, and the said penalties may be sued for, recovered and applied in the manner provided in section 11.

11. *Penalties and Recovery and Application of Certain Penalties.*—Every seller or keeper of an open shop for retailing, dispensing, or compounding medical prescriptions or poisons, acting in contravention of either of the three preceding sections numbered 8, 9 and 10 shall, for each contravention, be liable to pay a penalty of £5, and the said penalties of £5 may be sued for and recovered in the manner provided by the Pharmacy Act, 1852, for the recovery of penalties under that Act, and all and every sum and sums of money which shall arise from any penalties so recovered for offences incurred

under sections 8, 9, and 10 of this Act, or under the said Pharmacy Act, 1852, or under section 15 of the Pharmacy Act, 1868, shall be paid to the Treasurer of the Pharmaceutical Society of Great Britain, and shall by him be applied to the purposes of the said Acts, and this Act or either of them. And in any action or proceeding for the recovery of any penalty directed to be sued for by the Registrar of the Society in the name and by the authority of the Council of the said Society, the name of the said Society alone may be used, and it shall not be necessary to give evidence of the appointment of the said Registrar, or of the authority of the said Council and the full amount of the penalty incurred shall be recovered.

12. *Regulations may be made by Bye-law to Sub-divide Examinations, etc.*—It shall be lawful for the Pharmaceutical Society of Great Britain from time to time by any bye-law to make, alter, or amend regulations respecting examinations so as to divide or sub-divide the same, and to require and regulate periods of time and of practical experience, or any course of study between examinations, or any divisions of the same, and to regulate the notices to be given and the fees to be paid by candidates on the giving of notices for, or the passing of examinations or the several divisions of the same and on registration.

13. *Certificates of having passed Preliminary Examination Requisite to Apprenticeship.*—On any division or sub-division of examinations there shall be provided a division to be called the Preliminary examination and a Register of the persons who have passed the same, and thenceforth any pharmaceutical chemist or chemist and druggist who shall take as apprentice any person who has not previously obtained from the Registrar of the Pharmaceutical Society a certificate to the effect that he is registered as having passed the Preliminary examination shall be liable to a penalty of £5, to be sued for and recovered in the manner provided in clause 5.

14. *Certificates may be accepted in lieu of Preliminary Examination.*—It shall be lawful for the Society from time to time by any bye-law to accept evidence of degrees, qualifications, or certificates granted by other examining bodies in lieu of the said Preliminary examination and thereupon to authorize the Registrar to register the person entitled to the same as having passed the Preliminary examination.

15. *Certificates of Death and Expense of same.*—Notwithstanding the provisions of section 11 of the Pharmacy Act, 1868, every registrar of deaths in Great Britain shall, on transmitting to the Registrar under the Pharmacy Act, 1852, of every certificate of the death of any pharmaceutical chemist, or chemist and druggist, charge the cost of such certificate and transmission as an expense of his office.

16. *Certain Persons to be Registered as Pharmaceutical Chemists and Eligible for Membership.*—Every person who, after December 31st, 1886, shall obtain a certificate of competent skill and knowledge and qualification under section 6 of the Pharmacy Act, 1868, shall be entitled to be placed on the Register of Pharmaceutical Chemists and shall be eligible for election to membership of the Pharmaceutical Society of Great Britain according to the bye-laws thereof.

17. *Certain Persons to be Eligible for Membership.*—Every person who, on or before December 31st, 1886, shall have been registered as a Chemist and Druggist by reason of having obtained a certificate of qualification from the Board of Examiners, shall be eligible to be elected a Member of the Pharmaceutical Society of Great Britain, according to the bye-laws thereof, but no person shall, in right of membership acquired pursuant to this clause, be placed on the Register of Pharmaceutical Chemists.

18. *Certain Claims for Registration not valid unless made before 1st January*, 1885.—No claim for registration as a Chemist and Druggist made by notice accompanied by certificates of having carried on business before the passing of the Pharmacy Act, 1868, shall be valid or effectual unless notice in accordance with section 5 of the said Act be duly given prior to the 1st January, in the year 1885.

19. *Repeal of Section XI. of Pharmacy Act*, 1852, *and Section XX. of Pharmacy Act*, 1868.—Section XI. of the Pharmacy Act, 1852, and Section XX. of the Pharmacy Act, 1868, are hereby repealed.

20. *Penalties under Act not to Exempt from other Penalties.*—No penalty under this Act shall exempt any person from being liable to any other penalty, damages, or punishment to which he would have been subject if the Pharmacy Act, 1868, or this Act had not been passed.

21. *Penalty for Wilful Falsification of Register, or for obtaining Registration by False Representation.*—Any Registrar who shall wilfully make, or cause to be made, any falsification in any matter relating to the said Registers, and any person who shall wilfully procure, or attempt to procure himself to be registered under the Pharmacy Act, 1852, the Pharmacy Act, 1868, or this Act, by making, or producing, or causing to be made or produced any false or fraudulent representation or declaration, either verbally or in writing, and any person aiding or assisting him therein, shall be deemed guilty of a misdemeanour in England and in Scotland of a crime or offence punishable by fine or imprisonment, and shall on conviction thereof, be sentenced to be imprisoned for any term not exceeding twelve months.

22. *Extent of Act.*—This Act shall not extend to Ireland.

23. *Commencement of Act.*—This Act shall come into operation on the first day of January, one thousand eight hundred and eighty-four, and may be cited for all purposes as "The Pharmacy Act Amendment Act 1883."

Schedule of Poisonous Articles.

Sulphuric acid, commonly called oil of vitriol.

Hydrochloric acid, commonly called spirits of salts.

Nitric acid, commonly called aqua fortis.

Solution of chloride of antimony, commonly called butter of antimony.

Carbolic acid.

The Pharmaceutical Journal.

SATURDAY, FEBRUARY 10, 1883.

THE PHARMACY ACTS AMENDMENT BILL.

It is now no less than six years ago when Mr. Hampson brought forward at a Council meeting a motion that in anticipation of an opportunity for amending the Pharmacy Act of 1868, which might arise during the then ensuing session of Parliament, it was desirable the subject should be considered by a small Committee, and a report submitted to the Law and Parliamentary Committee suggestive of the amendments requisite. To those who have watched the course of events since that occasion it will be unnecessary to point out that the action thus commenced has been steadily followed up so far as circumstances would permit, and to those who have not done so, we may point to the lapse of time that has occurred without the introduction of a Pharmacy Act Amendment Bill as evidence of the difficulty of the task then entered upon by the Council of the Pharmaceutical Society. At length, however, we are enabled to place before our readers the draft of a Bill which has been adopted by the Council at its late meeting, and having been so adopted on the motion of Mr. Hampson, is to be regarded as the legitimate outcome of the work initiated by him six years ago.

At the commencement of the period we refer to experience had shown that notwithstanding the generally beneficial effect of the Pharmacy Act of 1868, it had proved in some important respects so far a failure that the Council had hesitated to test its strength from the fear that it might prove too feeble to bear the tension of a trial at law. Since that time the view then entertained by the Council has been conclusively proved to have been well founded and the necessity of an amendment of the Act has been demonstrated beyond dispute. Passing over the failure of an attempt to introduce a Bill in 1881, owing to the state of public business in Parliament at that time, we may remind our readers of what took place at a later period when a recommendation to make certain additions to the schedule of poisons was submitted to the Privy Council by the Council of the Pharmaceutical Society, inasmuch as the opportunity now offered for the introduction of a Pharmacy Act Amendment Bill has arisen out of the communications which then took place between the Council and that department of the Government. In November last the Lord President of the Council intimated that he would be glad to have the views of the Society in regard to the sale of poisons submitted for the consideration of the Privy Council in the form of a draft Bill amending the existing law. This has now been done, and the text of the draft Bill submitted will be found in our present number.

The discussion of the various subjects requiring consideration in the preparation of this Bill having been carried on in committee, we are, of course, unable to enter into any critical review of its several clauses, or of the reasons which led to their adoption, and can only refer to the remarks made by the individual members of Council as furnishing assurance of the care and pains that have been bestowed upon the elaboration of the Bill. It will suffice if we offer a brief *résumé* of the leading features of the Bill in language somewhat less technical than that employed in the document itself.

From the mere title and preamble of the Bill it will be seen that, in conformity with public demands, attention has been directed in the first place to the indiscriminate and unguarded sale of poisonous articles which has for some time past given rise to much just complaint from various points of view. In order to carry out the regulation of such sales, which is deemed to be expedient, the second clause provides that the retail sale of the articles named in the schedule shall be unlawful, unless they be distinctly labelled with their names and the word "poisonous," as well as the name and address of the seller. Power is also given to the Council of the Pharmaceutical Society, subject to approval by the Privy Council, to add to this schedule any articles the sale of which it considers ought to be thus regulated. In like manner Clause 3 provides that wholesale dealings in the articles included in the first part of the poison schedule of the Pharmacy Act, 1868, shall be so far regulated that the seller shall make a record in writing of each transaction and preserve it for twelve calendar months. The fourth clause also provides that it shall be unlawful to sell any patent medicine containing a poison within the meaning of the Pharmacy Act, 1868, unless labelled with the word "poison," and the name and address of the first seller of such article. This provision applies to wholesale as well as retail sales, and it is calculated to furnish some protection against the too frequent fatal cases of poisoning referrible to the undisclosed presence of narcotics or other potent drugs in various popular preparations, to the ignorant or careless use of which medical men have lately drawn attention as constituting a serious evil. In reference to the provisions of each of these three clauses, a penalty of from five to ten pounds for their infringement is defined by the fifth clause as that to which an offender is to be liable upon summary conviction. The sixth clause, however, provides a remedy in certain cases where the duly qualified seller of a patent medicine is exposed to penalties by reason of the infringement of the provision above mentioned and gives him a right to indemnification by the owner of the patent medicine or any intermediate seller of it, provided he furnishes proof of having purchased the patent medicine in question not knowing it to be otherwise than properly labelled and of having sold it in the same state as he purchased it. The adoption of precautionary mea-

sures in regard to popular preparations containing dangerously potent drugs would be thus in some degree ensured, and the responsibility of complying with the demands of medical men and others, in this respect, would rest upon the proprietors or original vendors of such articles.

To ensure the possession of the competent skilled knowledge held to be expedient in keepers of open shops for retailing, dispensing, or compounding medical prescriptions and poisons, clause nine provides that every such person shall be legally qualified under the Pharmacy Act, 1868, or entitled to and acting within the existing exemptions concerning medical practitioners, executors, administrators and trustees, and veterinary surgeons; but that the provisions of this clause shall not extend to, or interfere with, the business of wholesale dealers in patent medicines or poisons in the ordinary course of wholesale dealing.

Among the clauses which provide for the further regulation of sales of poisons by qualified persons which the preamble of the Bill sets forth as being expedient for the safety of the public the most important are first, clause seven, providing that the person on whose behalf any sale is made by an assistant, apprentice or servant, shall be subject to all the provisions of the Act in that respect; and secondly, clause eight, providing that the proprietor of any branch shop for retailing poisons, etc., dispensing medical prescriptions, shall employ there an equally qualified person occupied *bonâ fide* in the conduct of the business, the only exception to this requirement being that each partner in a duly qualified partnership may keep a separate open shop for retailing, dispensing, or compounding medical prescriptions, or poisons. By the provisions of these clauses due cognizance is therefore taken of the necessary possession of competent skill and knowledge by those engaged in dispensing medicines and retailing poisons as well as the personal reponsibility of proprietors of open shops. For the further attainment of these objects in conformity with the fundamental principles of the Pharmaceutical Society, while the first clause of the Bill provides that words importing the singular number only shall also include the plural number, clause ten provides that the keeper of any open shop for retailing, dispensing or compounding medical prescriptions or poisons, apparently implying that it is the shop of a person registered under the Pharmacy Acts, may be called upon by the Registrar of the Pharmaceutical Society to furnish a statement in writing of his name and address and qualification to sell or keep open shop, subject to a penalty of five pounds for each day that he fails to do so, and every person found selling poison or compounding medical prescriptions or acting in the management of such shop is likewise to be subject for each offence to a penalty of five pounds.

In a Bill to amend the Pharmacy Acts it is only natural and consistent with the progress which has been made during past years that provisions should be introduced in regard to the system of education by which competent skilled knowledge is to be acquired by pharmacists. As bearing upon this very important point in connection with pharmaceutical advance, clause twelve of the Bill empowers the Pharmaceutical Society to make, alter or amend regulations respecting examinations as may be from time to time found desirable, and as a further important step in the same direction clause thirteen provides that after a specified time the passing of the Preliminary examination shall be a condition indispensable for the reception of an apprentice by a pharmacist.

Clauses sixteen and seventeen contain provisions to facilitate admission to the Register of Pharmaceutical Chemists and to membership of the Society. These it is believed would materially assist in raising the public appreciation of the general body, and contribute largely towards the attainment of those objects which some of our correspondents have from time to time pointed out as necessary and for which they have suggested the establishment of a Fellowship of the Society.

The Evening Meeting held last Wednesday was a very interesting one; the attendance was better than usual, and no less than six papers were brought under notice. The first of these, on "Gelsemine," by Mr. Gerrard, will be found in another part of this number; but the publication of the others, together with the discussion, is deferred, through want of space, until next week.

* * *

At the Evening Meeting of the North British Branch of the Pharmaceutical Society, on Thursday evening next, the 15th inst., a paper will be read on "The Methods for the Separation of Alkaloids," by Dr. Matthew Hay.

* * *

From the report on another page it will be seen that the Committee of the Chemists' Ball have been able once more to send a subscription of twenty guineas to the Benevolent Fund. It appears probable also that the Committee of the Junior Pharmacy Ball will be in a position to contribute a similar sum. Mr. W. H. Kerr and his colleagues may well be congratulated upon the success which this result indicates as having attended their efforts to cater for the enjoyment of the younger members of the calling.

* * *

At the meeting of the School of Pharmacy Students' Association, to be held on Thursday, February 15, at 8 p.m., a paper will be read on "Linnæus," by Mr. W. E. Crow, and Mr. C. Thompson will make a communication on the "Separation of Cadmium from Copper."

* * *

The Annual Dinner of the Chemists' Assistants' Association will take place on Wednesday next, the 14th inst., at the Holborn Restaurant. The chair will be taken by Mr. Michael Carteighe.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL.

Wednesday, February 7, 1883.

MR. MICHAEL CARTEIGHE, PRESIDENT.

MR. SAMUEL RALPH ATKINS, VICE-PRESIDENT.

Present—Messrs. Andrews, Borland, Bottle, Butt, Churchill, Gostling, Greenish, Hampson, W. Hills, Radley, Richardson, Robbins, Savage, Schacht, P. W. Squire, Symes, Williams, Woolley and Young.

The minutes of the previous meeting were read and confirmed.

Members of the Council who Retire.

The lot being taken in the usual manner for the seven members of the Council who should retire in May next, the following names were drawn:—

Andrews.	Butt.	Robbins.
Atkins.	Radley.	Savage.
Borland.		

The following, who remained in by lot last year, now retire by rotation:—

Bottle.	Hills.	Symes.
Carteighe.	Richardson.	Woolley.
Hampson.		

The following remain in office for another year:—

Churchill.	Schacht.	Williams.
Gostling.	Squire.	Young.
Greenish.		

The following, being duly registered as Pharmaceutical Chemists, were respectively granted a diploma stamped with the seal of the Society:—

Foggitt, John Blackett.
Gilbert, William John.

Elections.

MEMBERS.

Pharmaceutical Chemists.

The following, having passed the Major examination and tendered their subscriptions for the current year, were elected "Members" of the Society:—

Foden, Edwin .....Manchester.
Fowler, George.....Birmingham.
MacDermott, Robert John .....London.
Nichol, Anthony .....Carlisle.

Chemists and Druggists.

The following registered chemists and druggists, who were in business on their own account before August 1, 1868, having tendered their subscriptions for the current year, were elected "Members" of the Society:—

Gater, James.....London.
Herring, Thomas .....Thorner.
Turner, Robert John .....Brighton.
Watts, John Newton .....London.

ASSOCIATES IN BUSINESS.

The following, having passed their respective examinations, being in business on their own account, and having tendered their subscriptions for the current year, were elected "Associates in Business" of the Society:—

Minor.

Allen, Samuel .....London.
Bridge, George Edward .....Southsea.
Christmas, William .....Croydon.
Clayton, Christopher .....Oxford.
Cluckie, Andrew .....Stranraer.
Dickinson, David .....Derby.
Fox, Charles James .....Croydon.
Francis, George Bult .....London.
Gelsthorpe, James .....Long Eaton.
Harris, Stephen.....Droitwich.
Jeans, Thomas Robert.. .....Pendleton.
Joy, Francis John Jessopp .....Cardiff.
Macaulay, William Henry .. ...Huddersfield.
Machin, William George.....Winchfield.
Mackaness, Charles .....Chesham.
Mackay, David.....Dundee.
Moore, Jonathan Reuben .....Kettering.
Norton, Thomas .....Broseley.
Patman, Frederick Thomas .....Whitehaven.
Raine, Ralph William .....Middleton-in-Teesdale.
Ranken, John .....Forfar.
Thomas, John Henry .....Hampton.
Whitrod, Henry Frederic .....Diss.
Wilding, George James .....Chessington.

Modified.

Abernethy, John .....Hoyland.
Martin, James .....Motherwell.
Morrell, Frederick Kent ... .London.
Thrower, Edward Arthur .....Diss.

ASSOCIATES.

The following, having passed the Minor examination and tendered their subscriptions for the current year, were elected "Associates" of the Society:—

Adamson, William Stewart ...Edinburgh.
Adler, Martin Woldemar .....London.
Bain, John .....Edinburgh.
Bing, Charles .....Canterbury.
Brisley, George.....Margate.
Cobden, Alfred George .....London.
Dunn, George Stewart .....Landport.
Fraser, James .....Edinburgh.
Gulliver, Walter Frederick ...London.
Holloway, Edwin Arthur .....Leominster.
Hopkinson, Harry .....Grantham.
Ivatt, Albert.....Cottenham.
Kerr, William .....Edinburgh.
Marsh, Edward.....Luton.
Pirie, William .....Arbroath.
Pope, Albert Harry .....Southport.
Ricketts, James .....Plymouth.
Rigden, George... .....Folkestone.
Rowand, Robert .....Glasgow.
Shackleton, Thomas.....Accrington.
Smalley, Arthur William .....Stamford,
Sutherland, John William .....Edinburgh.
Watson, Robert William ... ..Maryport.
Worts, Harry Augustine.....Harwich.

APPRENTICES OR STUDENTS.

The following, having passed the Preliminary examination and tendered their subscriptions for the current year, were elected "Apprentices or Students" of the Society:—

Adamson, Joseph William .....Epworth.
Alderton, James, jun. .....Leamington.
Almack, Edward Ambrose.....Bedale.
Archer, Luke .....Bolton-le-Moors.
Atkins, Alfred Edward .....Newport.
Austin, William Hoskin... .....Devonport.
Badcock, Henry John Francis Sheerness.
Bayley, Edward George .....Rye.
Beauchamp, Frederic Crawley...Hemel Hempstead.
Bellamy, Arthur .....Louth.
Bishop George Henry..... . Southampton.
Blain, William Rushton .....Bolton.
Blankley, George William .....Arnold.
Bostock, John .....Wilderspool.
Broomfield, Walter Henwood...Monmouth.
Burgess, Thomas .....Liverpool.
Burgess, William .....Runcorn.
Chantry, John Henry .....Horncastle.
Chapman, John .....Bedford.

Clarke, Richard .. ..Ruthin.
Clough, Thomas .....Liverpool.
Cooper, John James .....Castletown.
Crosthwaite, Daniel.....Blackpool.
Dick, David Laing .....Falkirk.
Dobson, George Edwin .....Bridlington.
Elliot, William Marshall.. .....Kelso.
Ellithorn, Arthur Henry.....London.
Evans, Frederic Ernest .....Lymm.
Fardell, Ernest Matthew .....Leicester.
Felton, William .....Maidstone.
Fraser, James Leslie .....Inverness.
Fraser, John Sutherland.....Forres.
Fryer, Charles John .....Warwick.
Gale, William Gillam .....Worksop.
George, Isaac .....Great Yarmouth.
Glanville, Henry Charles.....London.
Gradidge, James Henry .....Truro.
Gray, William Edwin .....Pickering.
Green, Herbert.....Hucknall Torkard.
Gregson, Joseph .....Manchester.
Greig, John .....Montrose.
Grime, James .....Darwen.
Haigh, Walter .....Halifax.
Hamer, Edward Sidebottom ...Pendleton.
Harradine, Holben Montfort ...London.
Harvey, James .....Flintham.
Harwood, John L. .....Redhill.
Hays, Frederick Arthur .....Birmingham.
Henderson, Henry Alfred .....Wibsey.
Hewitt, Joseph Frederick .....York.
Holt, Herbert Collins .....Bowdon.
Hordley, Henry Clement.....Stoke-on-Trent.
Humphreys, Thos. Henry P.S...Denmark Park.
Hutchinson, Edgar .....Newark.
Irving, Frederick William .....Donnington.
Jeans, Alfred .....Mansfield.
Johnson, Harry Haden .....Sedgley.
Kay, James Spencer .....Rochdale.
Keen, Walter H. ....Red Hill.
Lewis, Rees Martin.....Cheltenham.
Lloyd, Thomas Edward .....Pontypridd.
Lobbett, James Godfrey .....Hingham.
Lockwood, Joe .....Hyde.
Lovely, Charles Newton .....Ipswich.
Lowe, Albert John .....Guernsey.
Mallett, Henry Philip.....Norwich.
March, Thomas Frederick .....New Brompton.
Minchin, William.. .....Bedford.
Mitchell, Thomas Maxwell.....Leeds.
Moor, George .....Grantham.
Muddell, Claude .....Southend-on-Sea.
Murfet, Edward .....King's Lynn.
Oswald, Landle Rose .....Glasgow.
Otty, William Hare.....West Bromwich.
Painter, Frederick Hubert ..... London.
Palmer, William Mortlock .....Meldreth.
Parton, John Henry .....London.
Pepperdine, Lemuel Simpson...Lincoln.
Perrett, Samuel .....Bridgwater.
Peterkin, James .....Elgin.
Pick, Alfred .....Chester-le-Street.
Pierce, Robert Wynne C. .....Bangor.
Prosser, Evan Charles .....Colchester.
Reid, Neil .....London.
Renshaw, Frank .....Rochdale.
Rhoden, Samuel Thornton .....Sheffield.
Rogers, Francis Alfred .....Stamford.
Saul, John Edward .....Rock Ferry.
Sayers, William Charles.....London.
Sharp, John .....Galashiels.
Shenston, Robert .....Kenton.
Silk, Edward.....Macclesfield.
Sinclair, Matilda Anne .....Llandudno.
Smith, Burgess .....London.
Swan, William .....Dundee.
Taylor, Ernest Sanderson .....Grantham.
Taylor, Joseph Edward .....Wrexham.
Thomas, Joseph .....Garstang.
Thompson, Evelyn .....Ilkley.
Turner, John Edward .....Woodbridge.
Walker, George John .....Revesby.
Wheatcroft, Hoyland .....Rotherham.
White, Thomas Arthur .....Basingstoke.
Williams, William ..... Abergavenny.
Wilson, Robert John ....Chesterfield.
Wilson, William Potter .....Haddington.
Wood, John William .....Darlington.
Young, Edward .....Sudbury.

Restorations to the Register.

The names of the following persons, who have severally made the required declarations and paid a fine of one guinea, were restored to the Register of Chemists and Druggists:—

Joseph Hughes Merrett, 57, Hyde Park Road, Southsea.
George Oakes, 7, Market Street, Chorley.
Edmund Wood, 14, Cleveland Terrace, North Cross Road, East Dulwich, Surrey.

Several persons were restored to their former status in the Society upon payment of the current year's subscription and a fine.

Additions to the Register.

The Registrar reported that:—

John Herring Dingle, Bideford, Devon,
Septimus Frederic Leete, Thrapston,

having made statutory declarations that they were in business before the passing of the Pharmacy Act, 1868, and this declaration having been supported by duly qualified medical practitioners, their names had been placed on the Register.

Registrar's Report.

This Report, which is printed on pp. 652 and 653, as to the numerical strength of the Society, etc., was presented by the Registrar.

Reports of Committees.

Law and Parliamentary.

The Draft Pharmacy Bill.

The Council went into committee, while the President explained the alterations which had been made in the draft Pharmacy Bill since it was last before the Council, and the result of his interview with the officials of the Privy Council.

The Council then resumed, and the report of the Committee recommending for adoption the draft Bill, printed on p. 644, was read.

Mr. Hampson said he was very glad to find that the Pharmacy Acts Amendment Committee had been able to produce a draft Bill to the Council for its acceptance, though it had taken a long time to elaborate this Bill. He remembered the early stages of this question being raised by his friend Mr. Betty and himself, when it was found there were certain amendments required in the law, and it was thought desirable to have a committee to go thoroughly into the whole question. In accepting the position of moving the adoption of the report and the acceptance of this draft Bill he felt that it was a privileged position to occupy, inasmuch as, notwithstanding there were certain points which might be objected to, and others with which he might not feel in perfect sympathy, still looking all round the question, and looking at the condition of pharmacy in this country, and the agitation in respect of the sale of poisons, he felt that it would be scarcely possible to have a better Bill at present. It met all that was required at the present time; it might not go far enough in certain directions—it

might go too far in others, but he believed it thoroughly met the exigencies of the occasion, and therefore, he had much pleasure in proposing its acceptance. He did not think it was necessary now to go into the details of the Bill, but he would just refer to the Education Clause, for after all that ought to be the keynote which should be struck when asking for any fresh powers in connection with pharmacy. Pharmacists asked for these powers because they were educated men practising pharmacy, and it was necessary that certain legislation should take place. He was extremely happy to find that a young man when entering the business would be protected; that he would enter pharmacy under quite different auspices for the future; that it would be necessary for him to pass a Preliminary examination before he was apprenticed to a chemist, for that was really an important point. Then he should like also to refer to a portion of the Bill which would possibly raise opposition on the part of some pharmaceutical chemists. It was thought desirable at some of the earlier meetings of the first Committee that there should be an additional title adopted, that of "Fellow of the Pharmaceutical Society;" but it appeared to him that rather than make things more complex the true method was to make them more simple, and he maintained that by instituting, as was proposed by this Bill, one title only, which would be understood by all sections of the public, they were taking a very important step indeed. It would not only be a step in the simplification of the title, but would establish a means by which the Society would be strengthened. It had been found by experience that the number of pharmaceutical chemists joining the Society was so small that this class had already become weak, and if some steps were not taken it would become exhausted. This change was one which would tend to strengthen and consolidate the Society, and he was quite sure that although some pharmaceutical chemists might view it with suspicion and dislike, if they took a broad and loyal view of the position they would ultimately give it their cordial support. He would ask them to do this in the interests of the Society and of pharmacy, because it appeared to be a necessary amendment of the law. He would not occupy time further, but he hoped that when this Bill was seen by the pharmacists and chemists of the country they would, before forming a hasty opinion upon it, try to take an all round view, and that they would consider, as the Committee had considered, what was absolutely necessary and what was possible. There would be many disappointments, no doubt, that the Bill did not ask for further powers; for instance, that it did not provide that the compounds of the Pharmacopœia and drugs should only be sold by chemists, with other matters in the same direction; but the Committee had found such proposals utterly Utopian, and he was quite sure if the matter was thoroughly considered they would come to the conclusion that this Bill fully and consistently met the requirements of the times. He, therefore, begged to move—

"That the report and recommendations of the Law and Parliamentary Committee of January 10th and February 6th be received and adopted, and that the Pharmacy Bill in its present form be sent to the Lord President of the Council."

Mr. SAVAGE, in seconding the motion, said he must endorse all that Mr. Hampson had said, and he believed the country generally would accept the Bill now submitted, and express its very grateful thanks for the time and trouble which the Committee, and especially the President, had taken in connection with it. A great deal of credit was due to those who had framed the Bill, for many difficulties had presented themselves. Those who read the Journal from week to week were aware that every now and then some proposition came forward from a country member under the supposition that the Society could do everything and without taking into account for one moment the necessity of considering public requirements in this matter. He thought, so far as they could possibly be carried out, the propositions submitted in this Bill were such as would meet with the general approval of the trade.

Mr. SCHACHT said probably it would be as well if he now rose to say a few words which he thought it his duty to address to the Council. Although they might sound as a repetition in the ears of several gentlemen who might hear them, he should make no apology for doing so, because this was the first time the subject had been discussed with open doors. He was sure the President and the gentlemen sitting round the table would agree that they were not the only persons interested in the matter, and that not only their fellow members practising pharmacy, but the great body of the public were very materially interested in the provisions of this proposed Act. With regard to the Bill itself he should like to say at once that there was a very large portion of it with which he entirely sympathized, but there was no occasion for him to specially indicate which those portions were further than to say he referred to those portions which were continued on the lines of the existing traditions of the Society—those which aimed at protecting the best interests of the public by more or less limiting its powers of getting dangerous articles promiscuously. As far as all that went he was in entire sympathy with the Bill; but in those two portions in which new departures were made, and he emphatically asserted they were new departures, notwithstanding his radicalness of character he found himself too conservative to agree with the suggestions now made, and to these points he would briefly draw attention. In the preamble to the Pharmacy Act were these words, "Whereas, it is expedient for the safety of the public, that persons keeping open shop for the retailing," etc,, "of poisons, should possess a competent knowledge of their business," and so on, and in order to insure this, should pass certain examinations, and so forth, "be it enacted." All the rest of the Act included a recognition of the broad principle that in the best interests of the public it was not safe that everybody should have the possession or keeping and manipulating of dangerous drugs; but that a trained body should be recognized, into whose hands should be committed the charge of these dangerous materials, and that they should be responsible to the State for the individual members of the State using those articles for their advantage, and not their disadvantage. That was the principle which he believed had been acted upon by the Society from the beginning, and it was one he was exceedingly sorry to see in the least degree interfered with. In the provisions of this new Bill that principle was utterly torn asunder, and it was declared that though technically six or seven articles might be called poisons, and were still to be regarded as such, dangerous articles in the broad sense were to be manipulated exactly as the public liked, with the single exception that they were to be called "poisonous articles." That was the only limit to be put upon the traffic in them. The principle was to be admitted that it was not to the disadvantage of the public that all persons should be permitted to do what they liked with dangerous articles in the shape of drugs and chemicals. That was a principle he should be sorry to admit. If he were a member of Parliament he should oppose it to the utmost, and though the Government officials of to-day might recognize this principle, he believed the Government officials of to-morrow would not do so. The first occasion on which a disaster occurred they would all have to turn round and regret the action which to-day they were beginning to take. He exceedingly regretted that they should not have adhered to that policy which lay at the basis of all their previous efforts for improvement, one which he might say had the sanction and the whole prestige which attached to the action of the Society from its beginning. He had said this before, and would only say it this once more in public, be-

REGISTRAR'S REPORT.

MEMBERS, ASSOCIATES, AND APPRENTICES OF THE SOCIETY FOR THE YEAR 1882.

	Life Members.		Subscribing Members.		Associates in Business.	Associates not in Business.	Apprentices.
	Pharmaceutical Chemists.	Chemists & Druggists.	Pharmaceutical Chemists.	Chemists & Druggists.			
Number in 1881	238	2	1695	786	1069	...	..
„ restored, 1882 ...	...	...	8	3	4	...	...
„ elected, 1882 ...	1	...	35	15	115	..	...
	239	2	1738	804	1188	...	...
Deaths, Secessions, etc. ...	3	...	92	27	81	...	...
Total Strength of the Society	**236**	**2**	**1646***	**777**	**1107***	**824**	**1037**
Summary:—							
1881	238	2	1695	786	1069	817	1046
1882	236	2	1646	777	1107	824	1037
Increase	...	...	...	...	38	7	...
Decrease	2	...	49	9	...	...	9

COMPARATIVE STATEMENT OF THE NUMERICAL STRENGTH OF THE SOCIETY FOR 5 YEARS: 1878-82.

MEMBERS.—PHARMACEUTICAL CHEMISTS.

	1878	1879	1880	1881	1882
Restored to Membership ...	5	7	4	5	8
Elected „ ...	45	67	65	62	35
(Total additions) ...	50	74	69	67	43
Deaths, Secessions, etc. ...	79	91	82	101	92
Decrease ...	29	17	13	34	49
Total Number of Subscribing Members	**1759**	**1742**	**1729**	**1695**	**1646***

MEMBERS.—CHEMISTS AND DRUGGISTS.

	1878	1879	1880	1881	1882
Restored to Membership ...	4	1	2	3	3
Elected „ ...	25	19	24	18	15
(Total additions) ...	29	20	26	21	18
Deaths, Secessions, etc. ..	31	33	35	38	27
Increase ...	...	...	...	...	...
Decrease ...	2	13	9	17	9
Total Number of Subscribing Members	**825**	**812**	**803**	**786**	**777**

ASSOCIATES IN BUSINESS.

	1878	1879	1880	1881	1882
Restored	1	3	5	2	4
Elected	153	133†	137	131	115
(Total additions) ...	154	136	142	133	119
Deaths, Secessions, etc. ...	69	70	82	89	81
Increase ...	85	66	60	44	38
Total Number of Associates in Business...	**899**	**965**	**1025**	**1069**	**1107***

ASSOCIATES NOT IN BUSINESS.

	1878	1879	1880	1881	1882
Increase ...	...	19	13	...	7
Decrease ...	24	...	...	23	...
Total Number of Associates not in Business	**808**	**827**	**840**	**817**	**824**

APPRENTICES OR STUDENTS.

	1878	1879	1880	1881	1882
Increase ...	...	31	3	...	...
Decrease ...	14	...	...	28	9
Total Number of Apprentices or Students	**1040**	**1071**	**1074**	**1046**	**1037**

LIFE MEMBERS.

	1878.	1879.	1880.	1881.	1882.
Pharmaceutical Chemists	**243**	**241**	**237**	**238**	**236**
Increase	...	...	...	1	...
Decrease	4	2	4	...	2
Chemists and Druggists	**2**	**2**	**2**	**2**	**2**
Decrease	..	...	...	...	...

* 1 who paid as an Associate in Business, afterwards passed the Major, and was elected a Member.
† 134 were elected, but 1 afterwards passed the Major, and was elected a Member.

ANALYSIS OF EXAMINATIONS FOR THE YEAR 1882.

FIRST OR PRELIMINARY EXAMINATION

Number of Candidates during the Year.	Number of Successful Candidates during the Year.	Number of Rejections during the Year.	Number of Examinations during the Year.	Average Number of Candidates at each Examination.	Average Number of Rejections at each Examination.	Percentage of Rejections.
1269	629	640	4	317·25	160·00	50·43

MAJOR, MINOR, AND MODIFIED EXAMINATIONS.

ENGLAND AND WALES.

Number of days on which the Board met for conducting the Major, Minor, and Modified Examinations... 26
Average attendance of the Members of the Board of Examiners at each Meeting ... ... 15·25

Examinations.	Number of Candidates during the Year.	Number of Successful Candidates during the Year.	Number of Rejections during the Year.	Number of Examinations during the Year.	Average Number of Candidates at each Meeting.	Average Number of Rejections at each Meeting.	Percentage of Rejections.
Major	94	36	58	6	15·66	9·66	61·7
Minor	572	242	330	6	95·33	55·00	57·7
Modified	7	4	3	3	2·33	1·00	42·8

SCOTLAND.

Number of days on which the Board met for conducting the Major, Minor, and Modified Examinations... 7
Average attendance of the Members of the Board of Examiners at each Meeting 8

Examinations.	Number of Candidates during the Year.	Number of Successful Candidates during the Year.	Number of Rejections during the Year.	Number of Examinations during the Year.	Average Number of Candidates at each Meeting.	Average Number of Rejections at each Meeting.	Percentage of Rejections.
Major	9	4	5	4	2·25	1·25	55·5
Minor	78	44	34	4	19·50	8·50	43·6
Modified	1	1	0	1	1·00	0·00	00·0

THE REGISTERS OF PHARMACEUTICAL CHEMISTS AND CHEMISTS AND DRUGGISTS, 1882.

Additions during the year:—

Number of persons who have passed the—

Modified Examination		5
Minor „		286
Major „	40*	
Number of persons registered on payment of the Registration Fee, having been in business before August 1, 1868.....		7
Number of persons restored to the Register on payment of a fine		15
Placed on the Register by virtue of restoration to membership—Pharmaceutical Chemists .		3
Decrease of numbers on the Register . .		208
		524

* These having already been included in the number who passed the Minor, do not increase the numbers on the Register.

Erasures during the year:—

Deaths:—

Notices from Registrars		135
Other sources		124
Erased at the request of registered persons themselves.....		12
Erased by the Registrar in pursuance of the provision set forth in section 10 of the Pharmacy Act, 1868, after sending two registered letters to which no answer has been given .		253
		524

Number of Pharmaceutical Chemists on the Register, December 31st, 1882 2,275
„ „ Chemists and Druggists 11,172
13,447

cause he knew from the experience of the Committee meetings that he was in a hopeless minority; still he thought it his duty to call public attention to the fact and to express his opinion plainly and clearly. There was also another departure in clause 8 which he regretted, because it seemed to contravene the principle which he believed the Society had allowed itself to be mainly influenced by in all its efforts to promote high pharmacy, namely, to endeavour as much as lay in its power to provide that the individual pharmacist should be qualified to the highest degree; that he should be trained to exercise his powers with a due sense of responsibility, and that everything conducted in his name should have his own personal supervision. That it was not absolutely and legally possible to prevent supervision passing into other hands might be true, but to boldly sanction the handing over of responsibility to an assistant, to any extent, which this clause did, would be so far a departure from principle, which he exceedingly regretted. It seemed to him, once more, if it was to be considered right and proper that the pharmacist should have—as he would be hereby allowed by the authority of the Council to have—any number of shops in any number of places, so long as he carried them on under registered assistants, he could not see why anybody should not do so, because it was absolutely clear that practically a man could not supervise ten shops, and if power were given him to carry on ten shops by the aid of ten qualified assistants he could not supervise those ten shops any more certainly than a corporation calling itself a limited liability company could do. Therefore, he believed this was a great departure from the principle on which the Society had hitherto largely rested, and was giving up the position it had hitherto maintained, namely, holding the individual owner personally responsible for what went on in his establishment. Those were the two portions he had at other times protested against and still felt it his duty to object to. He was quite content to take the defeat which he knew was inevitable, but in the meantime he felt bound to make one public protest, and would, therefore, conclude by moving an amendment, namely—

"That the report of the Law and Parliamentary Committee be approved, with the exception of clauses No. 2 and No. 8 of the Bill."

Mr. Woolley said, in order that the amendment might come properly before the Council, he had much pleasure in seconding it. He held the same views as Mr. Schacht had just expressed, but he did not think it was necessary to take up time by going any further into them. He should, however, just like to say how much he appreciated the time and trouble which the President had given to this work. They were all under a deep debt of gratitude to him for the work he had done, and whether they agreed with the outcome altogether or did not, still the debt remained, and should be acknowledged. He took exception merely to the two points which Mr. Schacht had indicated, namely: the introduction of the term "poisonous" in the new schedule, and clause No. 8. The Bill in other respects contained much which would be beneficial to the trade, but the eighth clause seemed to him to acknowledge a mischievous principle, and might very well be omitted without any loss to the Bill.

Mr. Gostling felt some considerable sympathy with Mr. Schacht in the convictions which he held with reference to adding a list of poisonous substances which were to be sold by any person, and also with reference to keeping branch shops. No doubt if they were in a perfect state of society Mr. Schacht's views might be practicable; but he felt he must support the motion very cordially, because he thought the efforts of the Committee had resulted in suggesting the only practical means of meeting the position of pharmaceutical chemists, and of insuring to the public the amount of security it was possible to give. He felt that the provision with reference to patent medicines was one of the most important in the Bill, inasmuch as undoubtedly, especially in the case of narcotics, which were doing so much harm, the word "poison" being put upon them would have a great effect in limiting the use of those dangerous substances. He felt also with regard to branch shops that they could not be altogether dispensed with and that the provision here made was a very proper one. No doubt, in some cases, where branch shops existed under competent management, they were of great service to the public. With regard to this new schedule of "poisonous substances," he felt that that was the only practical way out of the difficulty. They all knew, and the public knew, that the Council had attempted to get certain things added to the schedule of poisons, but the Government had declined to accede, considering that it would be impracticable that chemists and druggists only should have the sale of the articles mentioned. With regard to the title of "Pharmaceutical Chemist," that was going in a liberal direction which he trusted would be accepted. Some pharmacists might feel aggrieved by it, but on a broad view he thought it might be accepted that the Committee had done the right thing.

Mr. Radley said his sympathies had gone a little beyond this Bill in certain matters, for considering the expense of the education which was likely to be required by those entering the trade, he thought they wanted some further protection, and his thoughts had gone in that direction, at any rate, in so far as regarded the compounds of the Pharmacopœia. But he had arrived at the conclusion that by pushing this point the whole Bill might be endangered, and as there were so many points which were desirable in this Bill he could not press those views at the present time. In reference to both the points named by Mr. Schacht, a decided advance was being made on anything that had been done before in protecting the public and with reference to themselves. With regard to branch shops there was something to be said as to the responsibility of the proprietor, which was a matter of very considerable importance. It was not simply having a branch shop with an assistant, but there were matters connected with the purchase of drugs, and the general supervision which the principal would have to attend to.

Mr. Bottle supported in its entirety the Bill now brought forward. He did not say it was all that he would aim at if he could see his way to its accomplishment, but he looked at legislation altogether as a series of compromises. Certain things were pressed upon the Council last year by the Lincolnshire Farmers' Association which the Government would not entertain, and Mr. Schacht had certain views of his own with regard to education, and he looked upon the Bill as a compromise. When it was printed and went the round of the trade, and of those interested in pharmaceutical matters, he believed there was no part which would be more objected to than the part which Mr. Schacht most energetically supported himself. So far as regarded the observation that the Council was making two new departures he differed from Mr. Schacht altogether. It was only recognizing that which already existed, and putting under surveillance that which had been winked at for the last ten years. He would not detain the Council longer except to personally thank the President for the zeal, energy, and ability which he had thrown into the business.

Mr. Young said it was not necessary to make any lengthened remarks on this occasion, and he might simply say he acquiesced entirely with the motion. He was satisfied from what he knew of the feeling of druggists in the North that this Bill would be received with acclamation. He was quite satisfied it was one of the best Bills which had yet been passed by the Council. It seemed to him to deal practically with all those matters which were the peculiarly crying evils of the present time, and none appeared to him so important as those which Mr. Schacht had referred to, No. 2 and No. 8. No. 2 was just one of those things of which every one sought a solution, but no one seemed to be

able to find the real one. Members of the Council knew that the public were supplied on all hands with these commodities. They felt that they could not hope to have them restricted to pharmacists without being actuated by a monopolizing spirit, which would have spoilt their case with any Government, because Governments now-a-days would act for the benefit of the general public. Pharmacists could not ask that the sale of all these things which had been sold by drysalters for so long a period should be given into their hands entirely. Three or four hundred years ago the sale of *aqua vitæ* in Scotland was restricted to the College of Physicians and Surgeons in Edinburgh. Then came some kind of reason by which for some composition they parted with it to the barbers, they being then qualified as surgeons. Nobody would ever think of restricting the sale of *aqua vitæ* now, and yet many people looked upon it as a very glaring poison. Clause 2 seemed to him to be the only practical means of getting over the difficulty. Then, as regards branch shops, if the clause passed it would place matters on a much better footing than they were now. It must be remembered that there were great changes in towns during the last twenty years. In Edinburgh and Glasgow there were old businesses which would have fallen to a very low ebb unless the proprietors had had it in their power to open branch shops. There were districts in those cities formerly inhabited which were now left entirely empty or converted into warehouses, and those who occupied them went into the suburbs. You must follow your customers if you wish to retain your business. He had often noticed the advertisements of Mr. Schacht, in which he described various articles which were manufactured by himself personally, but he did not see how he could be both in the laboratory and in the shop at the same time.

Mr. SCHACHT said he had a partner.

Mr. YOUNG said a qualified assistant was much the same as a partner. If this clause were carried out it would be a very great safeguard which did not exist at the present time, for there were many shops throughout the country which had not qualified persons to manage them. But the Council could go to the Government and say this was for the welfare of the community, and, therefore, demanded legislation. All were greatly indebted to the Committee which had charge of this matter so long, and especially to the President for the manner in which he had been able to negotiate it.

Mr. SYMES said, considering the position of pharmacy in the country and its relation to the public generally, he was prepared to accept the labours of the Committee, and the gigantic labours of the President, without any qualifying conditions whatever. The discussion would, he trusted, help members of the trade to understand at least some of the surrounding circumstances and difficulties under which the Committee brought forward the Bill. He should scarcely have felt it necessary to speak on the question, because most of the clauses were very clear, but as there had been some opposition to one or two of them he would say, in a few words, why he supported the Bill. The Pharmacy Act of 1868 had been quoted as containing the lines on which pharmaceutical progress should proceed, and from which it was a sort of sin to depart. If so, why was the Council going in for a new Bill at all? When that Bill was first drafted it was with the view to get as much as could be got at the time, seeing the opposition that had to be contended with, but it had not existed very long before chemists and druggists generally found reason to complain of it. This had gone on for a number of years, and it had been recently decided that it was a very imperfect Act. No doubt that had become the case by the growth of time, circumstances now not being the same as they were when the Act was framed. He simply asked the members of the trade that they should progress with the times and also be prepared to accept conditions to-day which they were not prepared to accept when the Act was first introduced. Exception had been taken to two clauses, and it was said the Council was initiating new departures. He thought that had been sufficiently answered already, inasmuch as provision was simply being made for restrictions on the sale of certain poisonous substances, which now could be sold without those restrictions, since the Council had failed to get any power to control the sale in any other way. The Council was not called upon to be the guardian of the public in all things, and he failed altogether to follow Mr. Schacht's argument that it was a very serious thing that the public should be allowed to have to do with dangerous things which did not go through the pharmacist's hands. If that principle were enlarged upon it would prevent the public having pistols, razors, and all that sort of thing, which had not come through their hands. It could not be recognized as a principle that the public should not have dangerous articles unless they were sold by a pharmacist.

Mr. SCHACHT said he referred to drugs and chemicals.

Mr. SYMES said, leaving that point the Council was providing for the good of the public. He must dissent from one word which had been used by Mr. Radley, when he said he had hoped for some further protection in the Bill. He would not use that word in a sentimental way, because he was no politician; but in considering this matter it must be considered apart from any idea of protection; if it were considered as the best means of protecting chemists and druggists it was an entirely erroneous idea. Those things were placed in their hands because they were more or less technically acquainted with them, and they had to administer them for the advantage of the public, not for their own benefit, though they should hope, as a matter of course, that in benefiting the public they would also benefit themselves. With regard to the question of branch shops, Mr. Schacht failed entirely to see how a branch shop carried on by a qualified pharmacist with a qualified assistant differed at all from a shop carried on by an unqualified person with a qualified assistant. Now that was thoroughly opposed to everything Mr. Schacht had said, year after year, hundreds of times almost, at the Council, and he was perfectly astonished to hear such a statement from him. He had told them all along that there was all the difference, and at any rate that the qualification of the master should cover everything. He had been seeking to have the individual pharmacist doing all the work himself. Now he (Mr. Symes) did scarcely any of the detail work in his own shop, though probably many of the public might think he made up all their medicines himself; but the commercial aspect of the question must be remembered as well as this ideal of professional character. If pharmacy were purely a profession, as it was more nearly on the Continent, that state might be arrived at. He was not intimately acquainted with continental pharmacy, but he knew something of it, and he should be sorry to see the pharmacists of this country drift into the condition of those in Paris; notwithstanding their professional character they seemed so utterly divested of vitality, of energy, and progress, of anything that would take them beyond the narrow limits of their immediate duties. He did not say there was not much scientific work done there occasionally, but he could not support that which would tend to narrow down pharmacy in this country, and to interfere with its progress. In the United States pharmacy was practised more freely probably than in any other country in the world, and they had been told by the President at that table that the pharmacists of the United States were the best in the world. He did not object to sentiment anywhere except in business, but if this matter were to be dealt with in a business way, the facts must be dealt with. There really was much greater protection where a business was owned by a qualified man and conducted by a qualified assistant than where it was owned by an unqualified person, and, therefore, he trusted what Mr. Schacht had said would

not influence the Council in dealing with the Bill now put before it.

Mr. ROBBINS thought the Committee might be congratulated on bringing forward a Bill which was approved by nine-tenths of the Council. This was not the first Pharmacy Bill which had come before it, and when the former one came forward there was a good deal of opposition all round, and at the last it was passed by a majority. There was nothing like the unanimity which existed to-day, and from that circumstance he hoped it might be taken that the present Bill would be received by chemists and druggists throughout the country in the same spirit. He had always noticed that where the Council had been much divided members outside had been divided in the same proportion, but where there had been anything like unanimity in the Council its resolutions had received general approval by the trade at large. Of course in a Bill of this kind there were many points on which individually they would like to make alterations, but they would never get a Bill which met the views of every one.

Mr. WILLIAMS said taking the Bill as a whole he supported it thoroughly. He had taken exception to one or two clauses in committee, but being defeated by a large majority it was not his intention to again raise a discussion on the matter; he bowed to the decision of the Committee, which was a large and influential one, and he was quite sure it represented the Council. He, therefore, accepted the Bill as a whole, and was satisfied that the more unanimous they were—and it would be better if they could be entirely unanimous—the better chance there would be of carrying it.

Mr. ANDREWS said the patience of the Council must be getting exhausted, but he should like to say a very few words. He could not commence without paying a tribute to Mr. Schacht and Mr. Woolley, for the very consistent way in which they had always acted as regarded this Bill on questions which they considered questions of principle, and if they had not spoken as they had done, he thought they would have acted wrongly. He sympathized with them to a considerable extent, but he thought they were mistaken, and he could not vote for the amendment, seeing the importance of the Bill and the necessity of the Council being agreed. He did not see that there was such a question of principle as they imagined, particularly with reference to clause 2. Chemists had never claimed a monopoly in the sale of dangerous things, nor could they get it if they tried. If the Bill were a new departure, if it were lessening in any way the power the Society previously possessed, Mr. Schacht would be right; but as it only regulated the sale of dangerous things by certain persons who already sold them, he could not see that there was any question of principle involved. With respect to clause 8 he was more in accord with him, but still he could not support the amendment, and looking at the necessity for a Bill in the interest of public security he was obliged to waive any objection he might have to that clause and support the Bill in its entirety. He should like to say, however, that he did not agree with the defenders of clause 8. Mr. Young had defended it because old houses of business, when their neighbourhoods altered, had to start branches in new neighbourhoods. That might be a good argument for such houses, but not for the public or for the necessity of the case. Taking the Bill as a whole, and recognizing the fact of its being in the interests of the trade generally, he must support it.

Mr. RICHARDSON wished simply to add his feeble thanks to the President and the Committee which had taken so much trouble in framing this measure, which he hoped would soon be presented to Parliament and become law. The President must have had considerable trouble in framing a Bill of this description, which would, as far as possible, meet the wishes of the trade and yet be acceptable to the Government, and he feared the constituents of the members of Council were hardly aware of the great difficulties the Council had had to encounter. Still he could not but think that, taking it all round, this Bill would prove acceptable to the great bulk of pharmacists. As to attempting to please everyone, it was evident from the letters which were written to the Journal, time after time, how impracticable some people's ideas were. He had considerable sympathy with Mr. Schacht, who was one of the leaders of pharmacy, and regretted that he took this stand on the present occasion, because it was a great misfortune that a gentleman holding such a position should not go heartily with the rest of the Council in this business. With regard to the schedule of "poisonous articles" it simply placed illiterate vendors of those articles under restrictions, which would to a certain extent assist pharmacists; it would tend to drive the trade in those articles more to the legitimate chemist, because there could be no doubt that a great many people, especially the smaller shopkeepers, when they found there were these restrictions placed upon them, would give up the sale in disgust. One thing he did not see in the Bill, but no doubt it had been discussed, and that was a clause exempting all chemists from jury service.

The PRESIDENT said it would have been impossible to claim that exemption for all existing chemists and druggists, and any attempt to do so would simply have led to an abolition of the existing exemption. But the provisions embodied in the Bill would exempt all chemists who qualified hereafter.

Mr. RICHARDSON said that was quite satisfactory. He had some knowledge of pharmacists abroad, and had never before heard them spoken of in the depreciating tone which Mr. Symes had used. He had always looked upon them as the great pioneers of scientific chemistry. He had much pleasure in supporting the Bill as a whole, and thought it would be acceptable to the great majority of wise-thinking chemists and druggists throughout the country.

Mr. GREENISH said that all he had to say on this Bill had been better said by those who had preceded him, but as a member of the Committee it might be thought if he did not say one word, he was lukewarm on the matter and that the Bill had not his entire sympathy. Such, however, was not the case; he believed if it could be accepted and passed the year 1883 would be a memorable epoch in pharmacy. He should have been quite prepared to accept another schedule of poisons. It seemed to him necessary that the public should be protected by having these articles labelled "poison," and chemists were not all in a condition to supply the public as they were now supplied with them; therefore a compromise must be come to, and he thought it was a most important alteration introducing the distinction between "poison" and "poisonous articles." Several other clauses also, such as Nos. 15 and 16, were very important.

Mr. HILLS said he should vote very cordially for the Bill in its entirety, but he considered it a compromise between conflicting interests, and in the main for the advantage of the public. The Council might not approve of certain evils or doubtful advantages which existed, but thought it better to regulate them than to leave matters as they were. The amendment had sole reference to two clauses. But there was another clause (No. 4) on which there might be difference of opinion. To his mind the sale of patent medicines, especially those containing poison, for internal use, was a matter of very doubtful advantage to the public; still the existence of those patent medicines had been already recognized, and it was better in the public interest that the word "poison" should be affixed to those which contained poisons than that the sale should be continued unrestricted. He objected to the principle of branch shops, but the practice existed, and therefore it was better to make some regulation for the protection of the public than to leave the matter open.

Mr. BORLAND said he gave the Bill his warmest support. At first he had no great liking for clause 2, as he thought the Society would be really legislating for a body outside of pharmacy, and that it would be virtually placing drysalters and others who were the sellers of the poisons mentioned in that schedule in what might be called a legalized position. But when he viewed the question from the point of public safety and considered that the schedule contained so very few poisonous articles he came to the conclusion to support the clause. The danger to the public under this proposed Bill would be really less than at present and that was one of the primary considerations which should be kept in view. With regard to keeping more shops than one, he might say that many medical men in Scotland, who visited in a large area, had assistants whom they placed in villages to meet the wants of the people; and where a privilege of that kind was accorded to medical men, he did not see why the Society should lay an embargo on some of its best members and prevent them carrying on a good business in the same way. The whole centre of Glasgow had been virtually converted into commercial offices and the inhabitants had gone west; so that those having shops in Glasgow must have shut them up if they had not the opportunity to carry shops westward after their customers. From conversations he had with many pharmacists in the North, he believed the Bill would meet with general acceptance.

Mr. BUTT was very pleased to be able to give his support to the Bill in its present form. For many years past he had seen the great difficulty arising from the want of a schedule of "poisonous articles," and it seemed to him that the Bill met that difficulty in the best possible way. Another clause embodied a principle he had supported for some years—that of making it compulsory for young men to pass a Preliminary examination before entering on their apprenticeship. A great hardship was often inflicted on young men who entered the business without knowing what they would have to go through, and as soon as this clause came into operation he felt certain it would have the effect of reducing the number of failures, by weeding out the greater proportion of those who were totally unfit for the business.

Mr. SQUIRE said that, being a member of the Committee, and having heard the discussions on these clauses, he was quite satisfied the Bill was the best which could have been framed at the present time. All the subjects connected with pharmacy had been brought under discussion while the Bill was before the Committee, and he believed the best result had been arrived at. Branch shops had existed and would continue to exist, for it could not be expected that any Act of Parliament could be brought in which should shut them up, and as they could not be shut up it was better to legislate for them. There was a vast difference between a branch shop owned by a qualified man and conducted by a qualified assistant and one owned by a person who knew nothing whatever about medicine, trusting entirely to an assistant who would have but a small monetary interest in the concern. As regards the schedule of "poisonous articles," he thought it would be a great protection to the public.

The VICE-PRESIDENT did not know that there was anything he could say which had not been said already, but he must thank the President for his exertions, and he hoped that his term of office would be marked by the passing of this Bill as an Act of Parliament. He must also express his admiration of Mr. Schacht's independence, for it required no small courage with the consciousness of standing almost alone to express his convictions as he had done, and he honoured that courage. However, he differed from Mr. Schacht and Mr. Woolley in the view they took, especially in regard to the first clause they had objected to, because chemists had never had a monopoly of the sale of poisonous articles, and never could ask for it, and if they did Parliament would never give it. Hence it was not a new departure when the Council was simply called upon to recognize that which already existed, but to recognize it only by imposing considerable restrictions which were all to the advantage of the public. He quite agreed with Mr. Bottle that all legislation in this country was, and must be, a matter of compromise, and for the chemists to go to Parliament to advocate their own interests alone would be simply to invite and secure defeat. That the Government department should have honoured the Society by asking it to be the co-ordinate power in imposing fresh legislation was a distinction which should be highly valued; things of infinite importance, upon which all were agreed, could be secured by conceding matter of infinitely less importance, and, therefore, he had no hesitation in giving the Bill his hearty support. He was not in favour of branch shops, but he was in favour of recognizing what could not be prevented by Act of Parliament, and legislating in favour of public security. If controversy arose on this Bill, as no doubt it would, it would probably be with regard to those points in which Mr. Schacht was most warmly interested. He was not sure that every existing pharmaceutical chemist would be willing to concede the right to this title conceded by this Bill, but he thought he might be asked to do so, as the concession would secure for the trade and for the country generally a much greater boon.

Mr. HAMPSON said, in reply to Mr. Schacht's objection to the schedule of "poisonous articles," he would specially state this broad fact; if the Committee had not undertaken to introduce a clause regulating the sale of those articles, Government would probably do it. Was it not better that the Council should have the control of this matter to a considerable extent rather than that the Government should introduce a Bill independently? He thought Mr. Schacht's opposition was altogether due to his having an exaggerated notion of what the true position was. If his position was sound, the trade ought to go to the Government and ask for a monoply for the sale of tobacco and cigars, because tobacco was included in the Pharmacopœia. The position of a branch shop was very different when the owner was an examined person, and when he was not; a qualified man being the owner of a shop could examine his assistant, could look generally to the conduct of the business, could hear complaints, and from his experience could assess the value of those complaints, whilst an unqualified man could not. He regretted that Mr. Schacht felt incapable of accepting this Bill on account of these two points, which seemed to him to be of secondary importance.

Mr. SCHACHT asked if he, as mover of the amendment, was not entitled to reply.

The PRESIDENT said that strictly he had not the right to a reply, but no doubt the Council would willingly listen to anything he wished to say.

Mr. SCHACHT said his position had been to some extent misunderstood. He never for a single moment argued that this Bill or any other Bill should contain a clause prohibiting the keeping of a second shop. There was no such prohibition now existing. But it was one thing to endure what you did not approve of, and another thing to endorse it by making regulations with regard to it; that was the aspect of the matter against which he wished to protest. Some of the gentlemen who had spoken considered that in adopting clause 2 there was no fresh departure from the course the Society had hitherto taken, but that was just where he differed from his colleagues. He had been told by one gentleman on the previous night that the position he took up was the most illogical he had ever heard of in his life; but it appeared to him that that gentleman was entirely wrong. The new departure consisted in this, that the Bill positively recognized that the interests of the public were sufficiently served in the matter of certain poisons by placing on the packet containing the "poisonous

article" the word "poisonous." That never had been recognized by the Society hitherto. It had always been understood that the principal advantage given to the public was that—the public being ignorant of the nature of poisonous articles, whilst pharmacists were educated to a full knowledge of them—the sole keeping and manipulation of poisonous articles had been placed in the hands and care of trained persons, and that it was those trained people alone who had the control of such materials; so that merely putting the word "poison" on should not be sufficient, but that the persons dealing with these things should know the nature and character of them and be responsible for them. The new departure was this, that the Bill would sanction the idea that sufficient care was taken of the public if the articles were simply labelled "poisonous." He believed that to be mischievous, and therefore opposed it in the best interests of the public as a distinctly new departure. There was already a poison schedule, and the Council went to the Government to get it enlarged. But the department said "No; you shall not do that, but on the contrary you shall recognize,"—at least, he supposed that was the purport of the communication—"that other people may deal in these things." It was mere nonsense to say that oil of vitriol was not as poisonous as oxalic acid or strychnine; he would rather swallow an ounce of strychnine than an ounce of sulphuric acid. What was the use of selling a groom chloride of antimony labelled "poisonous"? It would not prevent his buying it. It was now proposed to allow anybody to sell a groom chloride of antimony, and the groom did not care a straw for the label. He got the thing he wanted to give to the horse surreptitiously. On the other hand, if he had to go to the Vice-President's establishment to get it he would be very likely told he had better not have it, and if he insisted it might be refused. He objected to anyone being allowed to go to a blacksmith's shop and buy chloride of antimony under the idea that placing the word "poisonous" upon it was a sufficient precaution. It appeared to him that this was a distinct departure from the principle hitherto acted upon.

The VICE-PRESIDENT appealed to Mr. Schacht to withdraw the amendment, so that the Council might go to the department with a united front.

Mr. SCHACHT said he was in the hands of the President. Of course it would be hopeless to press the amendment, and if it were desired he should not object to withdraw it.

The PRESIDENT said if he were appealed to he must say that in his opinion it would be most fitting for Mr. Schacht to withdraw the amendment.

The motion was then put and carried *nem. con.*

FINANCE.

The report of this Committee was received and adopted and sundry accounts were ordered to be paid. Amongst the subscriptions towards the Benevolent Fund was a sum of twenty guineas from the Committee of the Chemists' Ball, and the President stated that he had reason to believe that a similar sum would be handed over by the Committee of the Junior Pharmacy Ball.

Mr. SCHACHT drew attention to an item of £18 12*s.* 6*d.* for cleaning two pictures in the Museum.

The Council went into committee to discuss this item, and also the question of the investment of part of the Society's funds at a higher rate of interest. It was arranged that this subject should be brought before the Committee at its next meeting, at which Mr. Butt was requested to be present.

BENEVOLENT FUND.

The report of this Committee included a recommendation of the following grants:—

£20 to a pharmaceutical chemist member from 1842 to last year, aged 82.

£20 to a pharmaceutical chemist member for many years, aged 62.

£10 to the widow of a former member.

£5 to a former associate of the Society, aged 58, who is out of employment.

£10 to the widow of a registered chemist and druggist.

£20 to the widow of a chemist and druggist to aid in getting a child into an orphan asylum. 2 previous grants of £15 each.

£5 to a registered chemist and druggist aged 60.

£5 to a registered chemist and druggist aged 59.

£5 to a registered chemist and druggist who has had eight previous grants.

£10 to a registered chemist and druggist, to assist him to emigrate.

£10 to the widow of a registered chemist and druggist, aged 32.

£10 to the widow of a registered chemist and druggist, aged 59.

£10 to the widow of a registered chemist and druggist, aged 62.

£10 to the Secretary's Casual Fund.

A letter was read from Mr. Houghton, who has charge of two of the Isherwood orphans, stating that he hoped to get the eldest boy into a wholesale house in the city before long.

Several other cases had been submitted to the Committee which had not been entertained.

This report was read in committee; on resuming the report and recommendations were unanimously adopted.

Vote of Thanks to the Local Secretaries.

It was moved by the Treasurer and carried unanimously:—

"That the best thanks of this Council be given to the Society's Local Secretaries for their efforts last year on behalf of the Benevolent Fund in making a personal canvass, accompanied by one or more members of the trade, and that they be earnestly requested to renew their efforts in the same direction this year."

LIBRARY, MUSEUM, LABORATORY, AND HOUSE.

Librarian's Report.

The report of the Librarian had been received, and included the following particulars:—

Attendance.		Total.	Highest.	Lowest.	Average.
December	Day	414	30	1	17
	Evening	124	18	2	8
Year 1882.	Day	4260	33	0	15
	Evening	1513	19	1	7

Circulation of books.	No. of Entries. Town.	Country.	Total.
December	144	113	257
Year 1882	1806	1444	3350

Carriage paid.

December . . . . £1 10*s.* 5*d.*

Year 1882 . . . . £23 9*s.* 10*d.*

The following Donations to the Library had been received, and the Committee recommended that the usual letter of thanks be sent to the respective donors:—

Accum (F.), Chemical Amusement, 4th ed., 1819.
From Mr. JOSEPH STAPLETON.

British Pharmaceutical Conference, Year-Book of pharmacy, 1882. 2 *copies.* From the CONFERENCE.

Gorkom (K. W. van), Handbook of Cinchona Culture, translated by B. D. Jackson, 1883.
From Messrs. TRÜBNER and Co., the Publishers.

Hooker (J. D.), Flora of British India, part 9.
From H.M. SECRETARY OF STATE FOR INDIA.

Méhu (C.), Sur l'extraction des matières colorantes des urines bleues (indigotine et indirubine), 1882.
From the AUTHOR.

Meyer (A.), Über Chlorophyllkörner, Stärkebildner und Farbkörper, 1882. From the AUTHOR.

New York State Pharmaceutical Association, Proceedings, 1880, 1882. From the ASSOCIATION.

Pennsylvania Pharmaceutical Association, Proceedings, 1880. From the ASSOCIATION.
Stocken (J.), Elements of Dental Materia Medica, 3rd ed., 1882. From the AUTHOR.

Curator's Report.

The Curator had reported the attendance in the Museum during December to have been:—

	Total.	Highest.	Lowest.	Average.
Morning .	240	25	1	12
Evening .	36	5	0	2

The following Donations to the Museum had been received, and the Committee recommended that the usual letter of thanks be sent to the respective donors:—

Specimens of Crystallized Xanthate of Potassium. From Mr. F. H. ALCOCK.

Specimens of the Leaves of *Eucalyptus globulus*, from which the oil previously presented was prepared. From Messrs. WARRICK BROTHERS.

Specimens of the Fruit of *Pterocarpus guianensis*, used in skin diseases. From Dr. H. E. CAUTY, Liverpool.

Specimens of the Root of *Tephrosia macropoda*, *Sium Thunbergii*, and of a native root called *Umundi*, of a bark called *Isibaha* and three bottles of Aloe Juice. From Mr. J. M. WOOD, Curator of the Botanical Gardens, Natal.

Specimens of Crystallized Naphthalene and of Naphthol. From Messrs. DOMEIER and Co.

Herbarium specimens of two varieties of the Damiana plant. From Messrs. PARKE DAVIS and Co.

A specimen of Ispahan opium had been purchased for the Museum.

The Professors had attended the Committee and reported satisfactorily of their respective classes.

Sundry applications had been received for loans of specimens, which had been acceded to.

Mr. HAMPSON asked if anything had been done lately respecting wood pavement in Great Russell Street.

The PRESIDENT said he had every reason to hope that this much-needed improvement would soon be carried out.

Mr. GREENISH drew attention to the gratifying fact that the attendance in the Library and Museum had lately been gradually increasing.

The report and recommendations of the Committee were received and adopted.

GENERAL PURPOSES.

This report, which, as usual, was read in Committee, included the monthly letter from the Solicitor as to cases which had been placed in his hands for prosecution. He reported that—

Sinton Michael Honan, 90, King Street, Hammersmith, had paid the penalty and costs.

George Theodore Imeson, 172, Caledonian Road, had paid the penalty and costs into court.

Also that execution had been issued in the case of—

James Kelsall, of 33, Sandy Lane, Stockport,

for the recovery of penalty and costs, but that "the officer of the court had reported that Kelsall had sold up and left the place."*

Several cases of alleged infringement of the Pharmacy Act were recommended for prosecution, and in the case of a member of the Society, who was reported to be practising medicine in the treatment of venereal diseases, etc., it was recommended that in accordance with the bye-laws, section xvii., the Secretary should be instructed to write to him for an explanation.

The report and recommendations of the Committee were received and adopted.

* This was the case reported in the *Pharmaceutical Journal* for November 18 last, p. 410.

REPORT OF EXAMINATIONS.

January, 1883.

SCOTLAND.

	Candidates. Examined.	Passed.	Failed.
Major (24th)	4	2	2
Minor (24th)	8	4	4
„ (25th)	11	6	5
„ (26th)	10	4	6
	—29	—14	—15
	33	16	17

Preliminary Examination.

Candidates. Examined.	Passed.	Failed.
331	194	137

Seven certificates were received in lieu of the Society's examination:—

4 College of Preceptors.
2 University of Cambridge.
1 „ Oxford.

The PRESIDENT said it might be interesting to read a letter which had been written by a former Bell Scholar, having reference to the examinations. It was always pleasant to find that the good intentions of those who had given money for educational purposes had not been mis-spent.

The letter spoke in the highest terms of the advantages which the writer had derived from the educational training he had received in the School at Bloomsbury Square.

THE ANNUAL MEETING.

The VICE-PRESIDENT, who had given notice of motion for holding the Annual Meeting and Conversazione, said he found that the usual day would fall at Whitsuntide, which would be inconvenient to many country members, and tend to prevent so large an attendance as usual. He therefore moved—

"That the Annual General Meeting of the Society be held on Wednesday, May 23, at 12 o'clock precisely, to receive the report of the Council; and to elect the Council and Auditors for the ensuing year."

"That a Conversazione be held on Wednesday, May 23 next. That the President, Vice-President, Treasurer, Messrs. Butt, Greenish and Squire, be appointed a Committee to carry out the necessary arrangements; and that the Secretary be instructed to apply to the Lords of the Privy Council for permission to hold the Conversazione in the Museum as usual."

The resolutions were carried unaminously.

PRELIMINARY EXAMINATION.

The PRESIDENT said he had received a communication from the Sub-Warden of Durham University, enclosing a scheme of examination which it was proposed to establish as a preliminary examination for any professional career, and asking if it would be accepted in lieu of the Preliminary Examination of the Pharmaceutical Society. He had examined the syllabus, which seemed excellent in every way, and suggested that he be authorized to state that the examination would be accepted.

This was unanimously agreed to.

A letter was also read from Mr. J. Clower, enclosing a list of subscriptions to the Benevolent Fund amounting to £1 17*s.* 6*d.*, which he had collected from Chemists' Assistants in Leamington.

Parliamentary and Law Proceedings.

Substitution of Sulphate of Cinchonidine for Sulphate of Quinine.

At the Bradford West Riding Police Court, on December 28, Joseph Walker, chemist and druggist, of Chapeltown, Pudsey, was summoned for selling a prescription different to what had been prescribed.

Superintendent Symonds said that from complaints received he sent a man to the defendant's shop with a prescription, and after receiving it he sent it to Mr. Allen, the analyst, Sheffield, who had sent back the following certificate:—The sample had not been dispensed in accordance with the prescription. It contained little, if any, real sulphate of quinine, the most important remedy prescribed. It contained, apparently as a substitute, sulphate of cinchonidine, to the amount of nearly half a drachm, or 30 grains in the 8 fluid ounces, or in the same proportion as sulphate of quinine was ordered. Cinchonidine was a body presenting many resemblances to quinine, but of much lower commercial value, as it was commonly considered to have inferior medicinal properties.

The defendant said that he was getting old and could scarcely see. On the 3rd inst., when the man came to his house, and asked for the prescription to be made up, he had had a very restless night, and was aroused out of bed by his wife; it was by a mistake that the wrong quinine was sold.

The Chairman said he had made his case worse by stating that he could scarcely see, as he had shown that he was not a fit man to be in a place to mix medicines for the public.

Defendant said that it was very seldom that a prescription came in the country.

The Chairman: And very lucky too.

The defendant said he hoped the bench would deal leniently with him.

The Chairman said that the defendant had made himself liable to a penalty of £20, but taking all into consideration, the case would be met with a fine of £5 and costs.—*Bradford Daily Chronicle.*

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Permanganate of Potash Pills.

Sir,—From an old story, whose date is coeval with the early days of chemistry, we learn that it was the boast of some devotees of this science, that by the use of a given quantity of sulphur, nitre and charcoal fire might be brought down from Heaven; but the significant postulate was added, "If you only know the way." Little did I think, when I forwarded you my mite of information, that 2 grains of permanganate of potash could be successfully mixed with the same quantity of powdered sugar in order to form an excipient, that I would thereby bring down the ire of Mr. Hart (no disciple obviously of Dalton), the sarcasm of Mr. Corder, and ironical compliments from Chester. The nature of the combined remarks might justly call for a reply to each, after its kind, but I forbear. I would rather commend to all your correspondents Mr. Corder's own recommendation, "Try again," in the hope that they may meet with more success, and in particular, that Mr. Hart may, thereafter, breathe with his wonted freedom. I confidently state that the pills were prepared as formerly described without any sign of combustion. They were also readily soluble in cold water, and, after subsiding, gave a distinct permanganate of potash colour and taste. Since then the process has been repeated several times with the same results. But in order to discern some of the wonderful results given by two of your correspondents, another sample of sugar was tried, and with care, pills were also prepared, which exhibited no signs of combustion. At the same time, when roughly handled and removed from the mortar with an iron or horn knife, a mild form of combustion was produced. In my former letter, I merely stated the result of my observations, and how the pills could be prepared. This I repeat. I decline, however, to enter upon any other question, while I do not consider myself called upon to account for the failures of others.

Edinburgh. James Mackenzie.

*** We insert the foregoing letter simply for the satisfaction of Mr. Mackenzie, though we do not think it would be conducive to that of our readers if they were so unwise as to follow the lead of his senior apprentice.—Ed. Ph. J.

Sir,—It being necessary that permanganate of potash be taken in a tasteless form, I would suggest that it be powdered and enclosed in ordinary gelatine capsules. Three grains of the salt can, with a little trouble, be compressed into a capsule no larger than an ordinary 5 grain pill, and in this form would undergo no decomposition.

London, W. W. H. Thomas.

Pungent Liniment of Iodine.

Sir,—Mr. MacEwan's note on the above is well worth the attention of any pharmacist who may be in the habit of preparing B.P. liniments with methyl alcohol.

Some years ago, when using liniment of iodine for articular rheumatism, I was very much annoyed with the pungent odour which it emitted, and which, to the eyes, was very irritating. The liniment I used was made with methyl alcohol, which Mr. MacEwan has proved to be an objectionable (and consequently unjustifiable) modification of the official formula.

Query—Is a chemist justified in using methylated alcohol in the preparation of any of the B.P. liniments?

John.

*** The use of methylated spirit in the preparation of medicines is restricted by law to those which are not capable of being administered internally; but even such preparations should not be made with it except with the cognizance of the persons ordering them.—Ed. Ph. J.

F. W. Doubleday.—Your letter has been handed to the Secretary, to whom all complaints as to non-delivery of Journal should be addressed.

Inquirer.—It does not appear probable that if such a contract were entered into by a Minor it could be enforced. But the question is one that should be submitted to a solicitor.

Frank C.—Your letter has been handed to the Secretary, who will forward to you the required information.

Nemo.—We do not think there is any pharmacy law in force in the State mentioned.

G. K.—Decoct. Aloes Co.

Veritas.—The mixture when recently prepared is not clear, the opacity being due to separation of the resinous matter of the tinctures, which subsides as a flocculent precipitate. There is no apparent decomposition in the mixture of liq. bismuthi and solution of sodæ bicarb. The liquor bismuthi used should be the B.P. preparation.

F. S. S.—A flocculent separation of colouring matter takes place and crystals of a salt of quinine appear to be formed; but the whole mixture should not become a solid mass.

W. F. Garry.—An answer to your question appeared in the number for Dec. 23. See before, in the present volume, pp. 90, 156 and 510.

Communications, Letters, etc., have been received from Messrs. Llewellyn, Johnson, Davis, Rees, Pollard, Sampson, Martin, Bradley, Warden, Vincent, Thomas, Powell, Kermath, Hetherington, Dodd, Paris, Inquirer, Alpha, Assistant, Local Assistant; H. M. H., W. G. W.

THE A. & H. MALT EXTRACT.

TRADE MARK.

A.D. 1715.

THE A. & H. MALT EXTRACT.—Allen & Hanburys desire to call the especial attention of the Trade to this article. The very considerable quantities required for certain dietetic articles, manufactured under letters patent with Allen & Hanburys' Extract of Malt, and the increasing demand for the Extract itself, have recently induced them to enlarge and improve their vacuum and other special apparatus for the production of the article, and they are now prepared to supply a very large demand. From the quality of the malted grain employed, and the care bestowed on the details of manufacture, including special temperatures throughout the process, Allen & Hanburys can with confidence recommend it as second to none in its flavour, nutritive value, and power of liquefying gelatinised starch, whilst they claim that it possesses the following advantages over other extracts in the market, under whatever name they may be sold :—

IT KEEPS INDEFINITELY IN ANY CLIMATE.

IT IS MORE CONVENIENTLY PUT UP.

IT IS CONSIDERABLY CHEAPER.

Sold in 8 and 16 oz. wide-mouth (almost cylindrical) bottles, with boxwood topped bunge, containing 12 and 24 oz. by weight, at (retail) 2/- and 3/6 each; 16/- and 28/- per doz.

The dietetic articles above referred to are:—

ALLEN & HANBURYS' MALTED FARINACEOUS FOOD. Sold in tins at (retail) 1/-, 2/-, 5/-, and 10/- per dozen; 9/6, 19/6, 46/-, and 90/-

FRY'S MALTED COCOA AND CHOCOLATE.

HILL'S MALTED NURSERY BISCUITS.

Allen & Hanburys will have much pleasure in sending a sample, carriage paid, to any member of the trade on application, or in giving special quotations for it, in bulk or otherwise.

Allen & Hanburys will be glad to make any medicinal combinations of their Malt Extract that may be desired, whilst they keep the following more important ones ready put up in the same description of bottles as the plain extract, retailing at 2/6 and 4/- each; 22/- and 34/- per dozen.

The "A. & H." Malt Extract with Hypophosphites.

The "A. & H." Malt Extract with Cod-liver Oil.

(This latter Allen & Hanburys make solely because a demand has been created for such a combination; they do not, however, recommend it, considering it unpalatable, and rendering the oil especially liable to become rancid. The two should be taken separately.)

The "A. & H." Malt Extract with Pepsine.

The "A. & H." Malt Extract with Pyrophosphate of Iron.

THE "A. & H." MALTED CHEMICAL FOOD

(REGISTERED)

Is a new and very palatable combination, consisting of the "A. & H." Malt Extract with the Phosphates of Iron, Lime, Potash, and Soda, in the same proportions as in the ordinary CHEMICAL FOOD, but possessing the following very great advantages, viz., that the sugar in the latter is entirely replaced by Malt Extract, an advantage so obvious that it is unnecessary to dwell on it. The combination appears a very happy one in every respect, and keeps perfectly. Put up in the same sized bottles as the Malt Extract, retailing at 2/6 and 4/-. Sample sent carriage paid on application to the Sole Makers—

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All the above Articles may be obtained through any Wholesale House.

NATURAL BITTER WATER OF FRIEDRICHSHALL

INGRAM & ROYLE,

119, QUEEN VICTORIA ST., LONDON, E.C. & BATH BRIDGE, BRISTOL.

Price List and Pamphlet on "Natural Mineral Waters : their Properties and Uses," forwarded on application.

BURROUGH'S SPIRITUS RECTIFICATUS, P.B.

SPIRITS OF WINE CHEMICALLY PURE

The Best English Grain Spirit, free from Fusel Oil.

56 over proof, 19/10 net, prompt Cash, for 5 gallon quantities; also Finest Orange Wine and Sherry for medicinal purposes.

CALE STREET DISTILLERY, LONDON, S.W.

Duty free for Exportation—also best Methylated Spirit at lowest prices.

Randall's Black Currant Lozenges.

	Net Cash.	To Acct.
Plain Black Currant, old square ...	2/6	2/8
" " " rough oval ...	2/6	2/8
Black Currant and Ipecacuanha ...	2/6	2/8
Black Currant and Tannin	3/0	3/3
Black Currant Voice (warm astringent)	3/0	3/3
Black Currant Cough Lozenges* ...	3/6	3/10

(*Ipecac. and Morph., strength as "B.P.")

In Bottles, 1lb., 2lbs., 4lbs., and 7lbs. For Exportation, in Soldered tins, of any size. From EDWARDS, London; through any Wholesale House; and from the Manufacturers,

RANDALL & SON, Southampton,

Who will forward Samples by post on application.

Also, BROWN COUGH LOZENGES, 2*s.*, 2*s.* 2*d.*; 7lbs. stamped with name free, and MUSK LOZENGES (*Special*), 2*s.* 6*d.*, 2*s.* 8*d.*

N.B.—Medical Lozenges of every kind, including those of the Pharmacopœia of the Hospital for Diseases of the Throat, London.

Regist. Trade Mark, No. 22,133.

Retail 1½d. each.

SOLE AGENCY
OFFERED TO THE
Retail Chemists of Gt. Britain.

To counteract cutting houses, and to keep up the Retail Price, the MANNA CAKE is supplied to *one Retail Chemist only* in each district, who has Exclusive Wholesale Profits. *Local Chemists must of necessity order through the Agent.* British Wholesale Drug Houses need not apply. 180,000 have now been ordered. Quantity sent to suit population. All newspaper arrangements are made by the agent at maker's expense. Extracts from Agents' letters: "The Manna Cake is selling well. It is an excellent preparation."—S. STEPHENS, Chemist, Huddersfield. "I highly approve of your system of agencies. Sales steadily increase, and I can recommend the article, not only on its own merits, but because of the assurance that I shall reap the advantage of futures also, however large, without fear of a ruinous lowering of prices."—J. H. KENDALL, Chemist, Blythe. N.B.—From Jan. 15th last to Feb. 4th (*i.e.* in 20 days), something over 150,000 Manna Cake was ordered from all parts of the country. For Terms send Stamp to Depôt, 268, Walton Rd., Liverpool.

JETTINE,

The only preparation which does not injure the leather.

Produces a perfectly black and permanent gloss, which will not rub off even when wetted, nor soil the most delicate article of dress.

It is invaluable for Ladies' and Children's Boots and Shoes, Waist Belts, Travelling Bags, &c. Each bottle is neatly packed in a cardboard box, and contains a sponge mounted and ready for use: thus JETTINE may be applied without soiling the hands.

MAY BE OBTAINED OF

Barclay & Sons, 95, Farringdon St., E.C.
Edwards & Son, 157, Qn. Victoria St., E.C.
Evans, Lescher & Webb, 60, Bartholomew Close, E.C.
Hovenden & Sons, 31 & 32, Berners St., W.
Lynch & Co., 192, Aldersgate St., E.C.
Maw, Son & Thompson, Aldersgate St., E.C.
May, Roberts & Co., Cowcross St., E.C.
Sanger & Sons, 150, Oxford St., W., or of
E. Penton & Son, 1 and 3, Mortimer St., W.

SAVARESSE'S CAPSULES

of membrane, each containing 15 drops Pure Maranham

COPAIBA BALSAM,

or, also of membrane, each containing 10 drops Purest Yellow

SANDAL WOOD OIL.

The efficacy of these valuable medicines is due to the ABSOLUTE purity of the Balsam or Oil, and to the very GRADUAL solvability of the membrane as compared with gelatine. Copaiba, 2s. 6d., 18s. doz. Sandal, 4s. 6d., 36s. doz. EVANS, LESCHER & WEBB, London; EVANS, SONS & Co., Liverpool.

FOR TERMS FOR ADVERTISEMENTS, SEE PAGE XVI.

POWELL'S BALSAM OF ANISEED

FOR COUGHS.

ESTABLISHED —(1824.)—

NOTICE TO CHEMISTS AND DRUGGISTS.

Show Cards and Counter Bills will be sent FREE on application.

Address:—

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FISHER'S

SOLUBLE ESSENCE OF

JAMAICA GINGER

Perfectly free from any Foreign ingredient.

The Proprietor invites the attention of Pharmacists and Manufacturers of Ærated Waters to the above preparation, which contains more of the Aromatic and Pungent principles of Jamaica Ginger than any other Soluble Essence yet introduced to the Public.

Price 4s. 6d. per Pound.

Special quotations to large consumers. To enable comparison with other preparations—which is respectfully requested—a sample bottle of 8 ounces will be sent, Carriage Paid, to any address in the United Kingdom, on receipt of Postal Order for 2s. 6d., by the maker,

F. D. FISHER, Pharmaceutical Chemist, Grantham.

TO CHEMISTS.

An Important Addition to your Business.

NUBIAN LIQUID WATERPROOF BLACKING,

THE ORIGINAL AND SELF-SHINING. ☞ NO BRUSHES REQUIRED.

Easily applied with sponge attached to the cork. Keeps its polish for a week in all kinds of weather. Cleanest, Best, and Cheapest for Boots, Shoes, Harness, and all Leather Goods.

Price **1s.** and **2s.** per Bottle.

NUBIAN FURNITURE POLISH,

In Glass Bottles and Cartoons.

Easily applied with sponge attached to cork. Will not smear or clog, and produces a brilliant polish with little labour. Price **6d.**

LADIES' "PET" BOOT POLISH.

A Light Dressing for Ladies' and Children's Boots.

A Preparation which does not soil the most delicate clothing, and will not harden or crack the leather or peel off. Price **6d.** per Bottle.

THE NUBIAN MANUFACTURING COMPANY, 8 & 9, Hosier Lane, Snow Hill, London, E.C.

GOODYEAR RUBBER COMPANY

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MANUFACTURERS OF

SYRINGES, ENEMAS, &c.

LAWRENCE BROS. 48, Farringdon St. E.C.

SOLE AGENTS FOR GREAT BRITAIN.

KILNER BROS., Glass Bottle Manufacturers,

Solicit orders for MEDICAL DISPENSING BOTTLES (Green and White Flint) and other kinds used by Chemists.

Also for their new Feeders. "OUR BABIES' BOTTLE."

(6d. Retail)
36s.
38s.
42s.
AND
44s.
per Gross.

(1s. Retail)
75s.
AND
81s.
per Gross.

(1s. 6d. Retail)
108s.
AND
120s.
per Gross.

Terms and Discounts forwarded on receipt of application stating quantity required. Large buyers liberally treated with. Illustrated Price Lists of all kinds of Bottles on application to KILNER BROTHERS, 10. Great Northern Goods Station, King's Cross, London.

SPECIAL NOTICE.

MUMFORD'S

PURE CRUSHED LINSEED

IS NOW REDUCED TO **19/-** PER CWT.

(*In smaller quantity, 20/- per cwt.*)

"NOTHING FINER CAN BE OBTAINED." NO OIL EXTRACTED.

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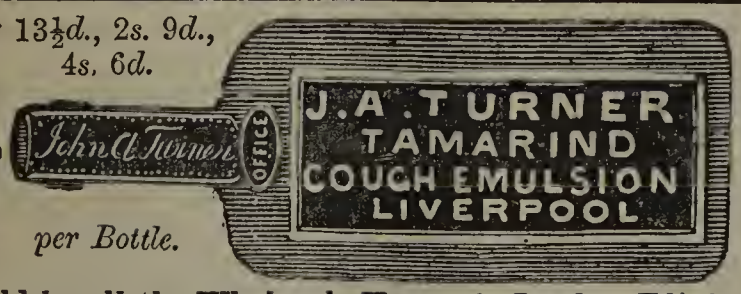

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FOURTEENTH SESSION, 1882-3.

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IMMEDIATELY, or at an early date.—A competent ASSISTANT. In-door. Only one employed. A neat and accurate Dispenser, steady, and of good address. Minor qualification preferred. State age, height, when disengaged, references, and salary required, and enclose carte. C. W. REED, 190, High St., Lewisham, S.E.

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Liquors.

NOTE ON SOLUTION OF PROTO-IODIDE OF IRON.*

By M. Ivan Obrecht.

(From the *Journal de Pharmacie d'Alsace-Lorraine.*)

Most of us have on our shelves a solution of iodide of iron prepared from the formula of Dupasquier or Jeannel, which we endeavour to keep in the state of proto-iodide by means of pieces of iron wire or *pointes de Paris.* The liquid is, however, by no means elegant in appearance; and it is not always pleasant to be handling, in full view of one's customers, a bottle containing old nails.

The syrup of iodide of iron of the German Pharmacopœia may be used in place of the solution, but this also turns yellow after a time. The same may be said both of the English and American preparations. A solid iodide is mentioned in the United States and British Pharmacopœias; and in Squire's "Companion to the British Pharmacopœia" (1871) a formula is given for a solution, which, however, will not keep without the addition of iron wire.

There is, however, to be found in England a solution of ferrous iodide, which meets all requirements. Fletcher and Stevenson, who prepare it, do not publish their process, but simply state that 34·4 grains of iodide are contained in each fluid drachm of their solution, equivalent to 2·167 grammes in 3·543 grammes, or 59 per cent. *The proportion indicated is perfectly correct; and I have not found any other substance in the solution.*

By having recourse to the process recommended by M. Willm (Dict. Ch. Wurtz, p. 1,424), i.e., evaporating a solution of iodide of iron in a current of hydrogen, I have succeeded in obtaining the same degree of concentration as the English preparation, and the product kept perfectly well in closed bottles for four months, but as soon as it was poured out it turned yellow, like the others. That made by Fletcher and Stevenson does not alter. A bottle of 750 grammes, opened in October last, still contains 125 grammes of a clear liquid, of a beautiful sea-green tint, 29 drops of which, measured by a Lebaigue's pipette, correspond to 0·5 gramme of ferrous iodide, which is the quantity required for producing 100 grammes of the syrup of the Codex.

Perhaps some brother pharmacist will interest himself in this product, and find out the *modus faciendi.*

---

* It may be desirable to state that we have had no communication whatever, either directly or indirectly, with the author of this paper. His remarks upon the Liquor Ferri Iodidi of our manufacture are entirely spontaneous and disinterested.

Pharmacists will do well to compare M. Obrecht's observations with a "Note on a Commercial Sample of Liquor of Iodide of Iron," contributed by Mr. B. S. Proctor to the Brit. Pharm. Conf., August, 1882. The solution which the author examined contained, according to his analysis, free oxalic, phosphoric, sulphuric, and hydrochloric acids, in addition to ferric oxalate and (probably) sulphurous acid.

In view of these statements, the maxim of *caveat emptor* should be borne in mind, and "commercial samples" of the preparation carefully avoided.

It is hardly necessary for us to say that we are prepared to give an absolute guarantee that our "Liquor Ferri Iodidi" does not contain, nor has ever contained, any of the so-called "preservatives" alluded to by Mr. Proctor.—(F. F. & S.)

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Holloway, London, N.

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The Pharmaceutical Journal AND Transactions.

THIRD SERIES No. 660.] SATURDAY, FEBRUARY 17, 1883. [PRICE FOURPENCE

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Pharmaceutical Society of Great Britain,

17, BLOOMSBURY SQUARE, LONDON.

ELIAS BREMRIDGE, Secretary and Registrar.

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EVENING MEETING.

The next EVENING MEETING will be held on Wednesday, March 7th, 1883, at Eight o'clock.

The Chair will be taken at half-past Eight *precisely*.

Papers intended to be read at that Meeting should be forwarded to the Secretary not later than Wednesday, February 28th, as papers received after that date cannot be announced in the *Pharmaceutical Journal* previous to the Meeting.

MAJOR, MINOR AND MODIFIED EXAMINATIONS.

The Board of Examiners for England and Wales meets at 17, Bloomsbury Square, London, in February, April, June, July, October, and December, and the Board of Examiners for Scotland meets at 119A, George Street, Edinburgh, in January, April, July, and October, for the purpose of conducting the above Examinations. Candidates must give notice to the Registrar in London, and pay the fee on or before the *first* day of the month in which the Examinations are held. Each candidate for the Major and Minor Examinations must, at the time of giving notice, produce a Registrar's Certificate of Birth, and a certified declaration that for three years he has been registered and employed as an Apprentice or Student, or has otherwise for three years been practically engaged in the translating and dispensing of prescriptions. Printed forms of declaration may be obtained from the Registrar in London. Each Candidate for the Modified Examination must state the number of the receipt for his declaration and his age at the time of giving notice.

Candidates will receive notice of the date on which they will be required to present themselves.

In the practical portion of the Major Examination standard works of reference are provided for the use of Candidates at the discretion of the Examiner. No other books or memoranda are allowed.

SPECIAL NOTE.

Each Candidate must state, at the time of giving notice, whether he desires to be examined in London or in Edinburgh.

Special Notice to Advertisers.—See page xi.

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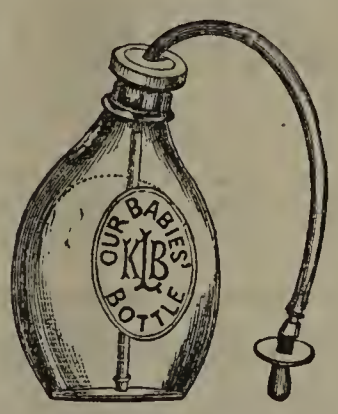

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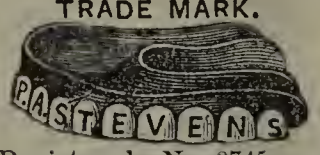

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AROMATIC SPIRIT OF AMMONIA.*

BY DR. THRESH,
Pharmaceutical Chemist.

History.—An aromatic spirit of ammonia appears for the first time in the Pharmacopœia Londinensis in the issue of 1721. Under "Medicamenta Chymica" is a "spiritus salis volatilis oleosus," prepared by distilling a mixture of cinnamon, mace, cloves, citron, sal ammoniac, salts of tartar and spirit of wine. In the 1746 edition the name is changed to "spiritus volatilis aromaticus," and the method of preparation is very different, for a "spiritus salis ammoniaci dulcis" is first made by distilling fixed alkali with sal ammoniac and proof spirit, and to this is added the essential oils of lemon, nutmegs and cloves, and the whole is again distilled. These are placed amongst the "Sales et Salina." In 1788 the name and mode of preparation are again altered. A "spiritus ammoniæ" is made by distillation and in this the oils of lemon and nutmeg are simply dissolved, forming "spiritus ammoniæ compositus." This is placed in the "Misturæ." In 1809 the name becomes "spiritus ammoniæ aromaticus," but the mode of preparation remains the same. In 1824 the compound bearing this name was ordered to be made in the same way as the "spiritus salis volatilis oleosus" of 1721, the mace being omitted and lemon substituted for citron. The alteration in the P.L. of 1836 was less than in any previous edition, the name remaining the same, the mixture to be distilled varying from that of the 1821 edition only in the strength of the spirit. Finally, in 1851, the proportions of nearly all the ingredients are altered, but no change is made in the method of preparation.

In the Edinburgh Pharmacopœia of 1722 occurs "spiritus salinus aromaticus" made by distilling a tincture of angelica, galangal, marjoram, anthos flowers, cinnamon, cloves, mace, nutmegs, orange and citron with salts of tartar and sal ammoniac. In 1792 the name becomes "sp. amon. ar. vulgo sp. salinus aromaticus," and the preparation is made by dissolving the oils of lemon and rosemary in a distilled spirit containing ammonium bicarbonate. In 1803 the same preparation occurs, but under the name of "alcohol ammoniatum aromaticum," which is changed in 1817 to "tinctura aromatica ammoniata." In 1839 the name again becomes "spiritus ammoniæ aromaticus" and the character of the article is somewhat altered, since the spiritus ammoniæ from which the compound spirit is made by addition of the essential oils of rosemary and lemon, contained *free* ammonia only.

The Dublin Pharmacopœia in 1807 contained a "spiritus ammoniæ aromaticus," and although in every subsequent issue the mode of preparation was altered the name was retained unchanged. In 1807 it was ordered to be made by distilling a dilute spirit with muriate of ammonia and wood ashes, adding bruised nutmegs and oil of lemon, and again distilling. In 1827 carbonate of ammonia ($3\frac{1}{2}$ ounces) was ordered to be dissolved in rectified spirit (3 pints); then after maceration with cinnamon and nutmeg and addition of lemon oil the mixture was distilled. This method was discarded in 1850, and distillation entirely dispensed with, a strong solution of ammonia being simply mixed with rectified spirit in which the oils of lemon, nutmeg and cinnamon had been dissolved.

Official Processes.—It will be observed that at the time when the British Pharmacopœia was compiled, there were in the British Isles three official aromatic spirits of ammonia, differing in flavour, strength, and in mode of preparation, and that in all the Pharmacopœias the processes given for the production of this medicament had varied with nearly every issue. At the present time compounds corresponding to our "spiritus ammoniæ aromaticus," B.P., are to be found in the U.S.P., the French Codex, and the Ph. Belg., all made by dissimilar processes. As the principal object of this communication is to point out a method of making this important galenical preferable to any yet adopted, it may be of interest to give somewhat more in detail the various processes and formulæ which the compilers of the above Pharmacopœias believed to be the best, after duly considering the experience of the two previous centuries.

The formula of the B.P. is too familiar to need quoting.

The sp. ammon. ar. of the new United States Pharmacopœia, which differs only very slightly from that of the previous edition, is ordered to be made as follows:—

"Take of

Carbonate of ammonia .	40	parts by weight
Water of ammonia . .	100	„
Oil of lemon	12	„
Oil of lavender	1	„
Oil of pimento	1	„
Alcohol recently distilled and which has been kept in a glass vessel . . .	700	„
Water	146	„

"To the water of ammonia contained in a flask, add 140 parts of distilled water, and afterwards the carbonate of ammonia reduced to moderately fine powder. Close the flask and agitate the contents until the carbonate is dissolved.

"Weigh the alcohol in a tared flask of suitable capacity, add the oils, then gradually the solution of carbonate of ammonia, and afterwards sufficient distilled water to make the product weigh 1000 parts. Lastly filter the liquid, through paper, in a well covered funnel.

"Keep the product in glass stoppered bottles in a cool place.

"A nearly colourless liquid where freshly prepared, gradually acquiring a slightly darker tint, of an aromatic, pungent, ammoniacal odour, and having a sp. gr. of about ·885."

In the French Codex we have—

"*Alcoholat aromatique ammoniacal.*

Ecorces fraîches d'orange . .	100	grammes
Ecorces fraîches de citron . .	100	„
Vanille	30	„
Cannelle de Ceylan	15	„
Girofles	10	„
Chlorhydrate d'ammonique .	500	„
Carbonate de potasse	500	„
Eau distillée de cannelle . . .	500	„
Alcool à 80° (·864)	500	„

"Incisez les écorces d'orange et de citron ainsi que la vanille; concassez la cannelle et les girofles, et introduisez le tout dans une cornue de verre, avec le sel ammoniac, l'eau de cannelle et l'alcool. Laissez macérer pendant trois ou quatre jours, en agitant de temps en temps. Ajoutez le carbonate de potasse; mélangez exactement, et, apres quelques heures distillez au bain-marie pour retirer 500 grammes d'alcoolat aromatique.

* Read at an Evening Meeting of the Pharmaceutical Society, February 7, 1883.

"Cet alcoolat se colore assez promptement à la lumière. Il faut le conserver dans des flacons de petite capacité, bouchés à l'émeri."

The Belgian spirit is called—

Alcoholetum aromaticum ammoniacale.

and is prepared as follows:—

"Alcoholat aromatique	920
Ammoniaque liquide	50
Carbonate d'ammoniaque pulvérisé	20
Huile essentielle de girofles	2
Huile essentielle de macis	2
Huile essentielle de marjolaine	2
Huile essentielle de citron	4

"Mêlez le tout dans un flacon bouché à l'émeri et secouez pour obtenir un solution homogène."

The "alcoholat aromatique" is obtained by distilling a tincture of marjoram, cinnamon, nutmeg, cloves and coriander.

Comparison of Typical Processes.—The method official in the Codex is one of the oldest and most defective. The product is very variable and contains much free ammonia produced by dissociation of the carbonate. It rapidly becomes coloured by the action of light, and contains less than 70 per cent. of absolute alcohol. As the process is unscientific, yields a defective product, and has consequently been discarded by all other Pharmacopœias, it does not require further notice.

The process official in the United States has the great advantage of dispensing entirely with distillation, and should yield a product of perfectly definite strength. Unfortunately in the new Pharmacopœia the "alcohol" is ordered of sp. gr. ·820, and therefore containing about 91 per cent. of absolute alcohol by weight, whereas in the last Pharmacopœia the "alcohol" was of same strength as our rectified spirit. With spirit of 84 per cent. all the carbonate of ammonia remained dissolved when the solution was added, whatever might be the temperature at the time; but with this stronger spirit I find that at 50° F. a considerable amount of ammonium carbonate is deposited when the two fluids are mixed. If put in a warm place (temperature 70° F.) for a short time, however, the carbonate is dissolved, but upon cooling a portion is redeposited. When made with the alcohol, sp. gr. ·834, of the last Pharmacopœia, the whole of the salt remains in solution at 32° F. Even with the stronger alcohol, if the solution of ammonium carbonate be heated to 150° for a few minutes, and then when cold added to the spirit, no precipitate is formed.

When all the salt is in solution this aromatic spirit contains 4·88 per cent. of normal ammonium carbonate, and ·42 per cent. of free ammonia, together with 63·4 per cent. of absolute alcohol. The spirit of the last edition contained only 59·5 per cent. of alcohol.

The only real objection to this process is that by keeping the spirit becomes discoloured. In my opinion also the aroma of a sal volatile made in this way is not so fragrant as it is when prepared by distilling the spirit and essential oils together.

The Belgian process resembles somewhat that of the United States, differing only in the fact that a distilled aromatic spirit is employed as the menstruum instead of plain spirit. Inasmuch as essential oils are afterwards added to the spirit, together with the ammonia salt the same objections apply to this process as to the previous one. It contains 2·4 per cent. of ammonium carbonate, ·6 per cent. of free ammonia and 62·1 per cent. absolute alcohol.

The B.P. spiritus ammoniæ aromaticus differs from all the above in being prepared entirely by distillation. It would appear as if the compilers of the Pharmacopœia had intended the finished product to contain 8 per cent. of normal ammonium carbonate and no free ammonia; but, inasmuch as it contains 67·7 per cent. of absolute alcohol, 4 per cent. of ammonium carbonate is the maximum amount it can hold in solution, and to obtain it of this strength it is necessary to operate on small quantities, and observe a number of precautions during the distillation; the remainder of the ammonia is then found dissolved in the free state, the carbonic acid corresponding thereto having escaped. A very considerable experience in the manufacture of this article in quantities of from 1 to 4 gallons has led me to form the following conclusion:—

1st. That the product varies considerably in strength and in relative proportions of ammonia and ammonium carbonate, this variation depending upon the quantity of material operated upon, the rapidity with which the distillation is conducted, and probably upon other factors.

2nd. That the larger the quantity of spirit distilled the poorer is the product in carbonic acid.

3rd. That working with the B.P. quantities *in warm weather*, and employing every precaution to prevent loss of ammonia, and to transfer all the carbonate deposited in the condenser into the distillate, the product will contain 4 per cent. Am_2CO_3, and 1·42 per cent. NH_3.

4th. That in cold weather the solution thus made deposits crystals of the ammonium carbonate. If made in winter, the whole of the salt condensed in the worm does not dissolve when shaken with the distillate, unless the latter is heated. Of course, upon cooling, the excess again separates.

5th. That in the B.P. process from 1·4 to 1·6 per cent. of the spirit remains behind in the still. To obtain all the alcohol at least 7½ pints must be distilled.

These conclusions are fully substantiated by the results obtained upon the analysis of samples from the first pharmacies, and from manufacturers of the highest repute, which results were communicated to the Pharmaceutical Conference in 1880. With regard to appearance, aroma, and keeping qualities, our spiritus ammoniæ aromaticus leaves nothing to be desired, but in the more important matter of constancy in strength, it is anything but satisfactory.

As the numerous proposals which have been made to remedy this serious defect in the official process have all either been obviously inapplicable, or have not been submitted to the test of actual experiment, a series of experiments was planned and carried out in my laboratory. As a consequence, I most unhesitatingly condemn every process necessitating the distillation of the ammonium carbonate with the spirit. A number of samples of spirit of ammonia was prepared, in which the quantity of free ammonia and official carbonate used corresponded to from 0 to 1·5 per cent. of NH_3, and from 2 to 4 per cent. of $(NH_4)_2CO_3$ in the finished product. Invariably during the distillation CO_2 was lost, and the spirit was deficient in carbonate. This was the case, however the proportion of water and alcohol in the retort was

varied, and whatever was the alcohol strength of the distillate. The suggestion to make the B.P. spirit without distillation has been offered by several pharmacists, but none of them have shown that this can be done. True, a sal volatile is ordered in both the Belgian and United States Pharmacopœias to be made without distillation, but both contain considerably less alcohol than our preparation. Taking the official quantities, the ammoniæ carbonas refuses to dissolve in the requisite amount of water and solution of ammonia without the aid of heat, and of that which does so dissolve *nearly the whole* is thrown out of solution on addition of the spirit. When, however, the solution has been effected by the aid of heat in a securely closed vessel, the addition of the alcohol causes, at ordinary temperatures, the precipitation of only about half the ammonia as normal carbonate, the other half remaining in solution also as normal carbonate. When the proportions of ammonia and ammonium carbonate employed are such as to yield a product containing 4 per cent. of normal carbonate, the aqueous solution prepared without heat precipitates copiously on the addition of the spirit; but when the salt and dilute ammonia have been heated in a tightly corked bottle to about 150°, and then when cold mixed with the spirit, only a small quantity of the normal carbonate, depending upon the temperature, is thrown down. Evidently, therefore, when the official carbonate is dissolved in cold dilute ammonia it does not combine with the free NH_3 to form the normal carbonate until heat is applied. The further application of heat then, in either alcoholic or aqueous solution, causes at least partial dissociation and evolution of CO_2. As yet the temperature limits at which the combination of the ammonia and acid carbonate takes place and the rapidity of the combination at any given temperature have not been observed.

Using a more dilute spirit an alcoholic solution can be prepared without the aid of heat, which will contain at 0°, 4 per cent. of normal carbonate or its equivalent of acid carbonate. This was done in the last U.S.P. by adding so much spirit to the aqueous solution that the product contains 59 per cent. of alcohol, or 9 per cent. *less* than is contained in our sal volatile. The process of the Belgian Pharmacopœia also yields a product of reliable strength, but neither this nor the spirit official in the United States is equal to our own in appearance, aroma, and keeping qualities. It would serve no useful purpose to recount all the experiments made to produce a sal volatile having the advantages with regard to aroma, etc., of the one, and the definite composition of the others, by a process which should also entail no loss of alcohol in the distillation. The formula which appears to me to be the most likely to supersede the present one is as follows:—

Take of

Oil of lemons	℥viss.
Oil of nutmeg	ʒivss.
Rectified spirit	6 pints.
Water	3 pints.

Distil 7 pints, set this apart; then continue the distillation until 9 ounces more have been collected.

Take of

Ammonium carbonate	4 ozs.
Stronger solution of ammonia	8 „
The last portion of above distillate	9 „

Place in a bottle holding a little more than 1 pint, cork securely, and place the bottle in a water-bath at about 140° F.,* shaking from time to time until all the salt has dissolved. When cold, filter if necessary through a little wool, and pour into it gradually the seven pints of distilled spirit.

The product will measure 1 gallon; its specific gravity is ·886, and it contains 3·45 per cent. of normal ammonium carbonate and 1·23 per cent. of free ammonia. Whilst not quite so strong as it is possible to make a spirit of ammonia by the official process, it is considerably above the average strengh of the sal volatiles of commerce. From the more dilute character of the spirit none of the carbonate is thrown out of solution even at 0° C., and by the continuing the distillation a little beyond the point now ordered (in the B.P.), the whole of alcohol is contained in the finished product instead of a portion being wasted as heretofore.

One fluid ounce requires for neutralization 558 gr. measures of the volumetric solution of oxalic acid, and the same quantity after the addition of 330 grain measures of solution of barium cloride (1 in 10) should yield when filtered a further precipitate when more of the reagent is added.

Doubtless this formula may be varied in many ways, but so far as my experience goes, it is the one which is most likely to give general satisfaction. Probably many would prefer to be able to purchase the spiritus aromaticus, and add thereto the solution of ammonium carbonate. Should it be deemed advisable to encourage this, 7 parts only need be distilled, and water used for dissolving the salts. To form the sp. am. ar. it would then only be necessary to add 7 parts of the spirit to 1 of the alkaline solution, and this product would not appreciably differ from that made by the beforementioned process. The loss of alcohol (on an average 1½ ounce) would be the same as in the process at present official.

For comparison, the results obtained by analysis of a sample of sp. am. co., made by the method here recommended, are given, together with the mean of the results obtained from nineteen B.P. samples examined in 1880.

	Free NH_3 per cent.	Am_2CO_3 per cent.	Total, NH_3 per cent.
New process . .	1·25	3·53	2·49
B.P. process (means of nineteen samples)	1·33	1·88	1·99

[*The discussion on this paper is printed at p.* 674.]

AN APPARATUS FOR CONTINUOUS EXTRACTION.†

BY WYNDHAM R. DUNSTAN,
Demonstrator of Chemistry,.
AND F. W. SHORT,
Assistant-Demonstrator of Chemistry in the Laboratories of the Pharmaceutical Society.

During an investigation which necessitated speedy and thorough exhaustion, trial was made of the principal forms of apparatus proposed for this purpose, and which admitted of construction out of the materials ordinarily found in a chemical laboratory. Among these was the second apparatus proposed by B. Tollens (*Zeits. f. anal. Chem.*, xvii., 320). It consisted of two tubes, the larger one of which was

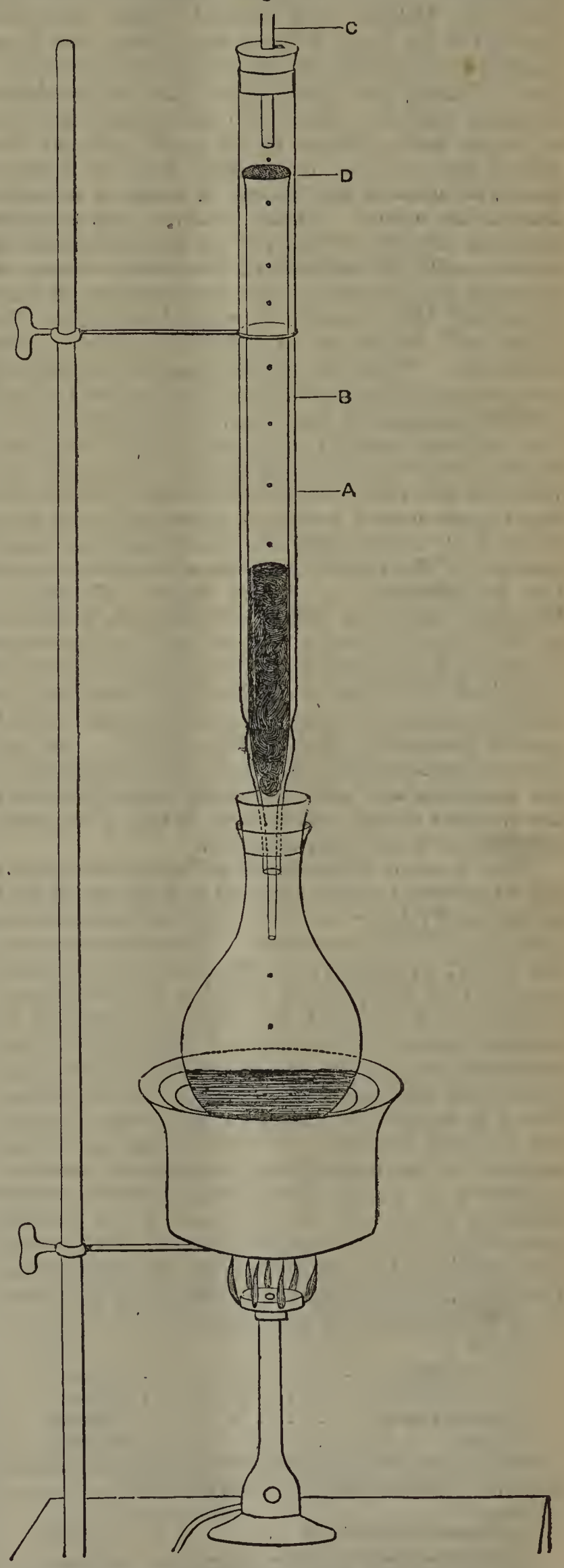
* Solution may be effected without the aid of heat, but not nearly so readily.

† Read at an Evening Meeting of the Pharmaceutical Society, February 7, 1883.

drawn out to pass through a cork in the ordinary way; the smaller tube was of a size which allowed it to fit with much margin into the larger tube, and was cut off straight at both ends, one end being tied over with a piece of filter paper. This tube was packed with the material and placed in the larger tube, so that the closed end rested upon a piece of curved glass rod placed across the contracted portion of the larger tube. This tube was then connected with a condenser. In the use of this apparatus many difficulties were experienced, which suggested the form of apparatus which we now describe. The principle is the same as that involved in the apparatus of Tollens, and, indeed, in many other forms of apparatus which have been used for a similar purpose. It differs in construction and in the fact that it can be used either for digestion, for repercolation, or for both at the same time, the whole operation being conducted at the boiling point of the solvent.

It consists of two tubes, A and B, the larger one being drawn out at one end to such a diameter as will admit of the smaller tube, which is also drawn out, passing through it. The outer tube is indented on each side, by which means two ledges are formed within the tube, which serve as supports for the smaller tube. This is easily accomplished by gently pressing each side of the tube when red hot by means of crucible tongs.*

The substance to be exhausted is placed in the inner tube, the narrow end of which has previously been plugged with a piece of cotton wool. A wire gauze cap, D, fits upon the other end of this tube and prevents possible ejection of the substance from the tube; the use of this cap, however, may usually be dispensed with. The outer tube containing the smaller tube is now connected with a flask by means of a cork though which the contracted portion of the tube passes, the other and open end being fitted with a cork and long upright tube C which acts as a condenser, its length depending upon the nature of the solvent operated with. The extent to which the inner tube is drawn out depends upon the purpose for which the apparatus is required. If drawn out to a fine point and allowed to pass someway beyond the rim of the outer tube the apparatus can be used for digestion. The vapour of the solvent will pass up the outer tube, and after condensation by the upright tube will drop into the inner tube, forming a column of liquid above the marc which will slowly permeate the substance, but while the liquid in the flask is boiling but little will return to the flask. In this way the substance is digested with the solvent at a temperature close upon the boiling point of the liquid. When the source of heat is removed the column of liquid will percolate through the marc into the flask, and the digestion can again be effected with a fresh portion of the solvent. If the inner tube be drawn out so that it extends only a short distance beyond the rim of the outer tube, as shown in the diagram, and its diameter is but little smaller, digestion and repercolation will go on together. The most advantageous way of using the apparatus is as follows:— The substance having been loosely packed in the inner tube and some of the solvent poured over it and the rest placed in the flask, heat is applied; the liquid in the state of vapour will pass up the outer tube and be condensed by the upright tube, the drops of liquid falling upon the substance and rapidly percolating through it into the flask. If the boiling be now continued fairly rapidly, the amount of liquid condensed in a given time will exceed that



which percolates through, with the result that a column of liquid will gradually form over the marc

* The tube A should not be too long or the vapour will be condensed to a greater or less extent in this tube before reaching the condenser C.

in the inner tube. When this has occurred it will be found that the vapour has made its way through the marc and is bubbling through the column of liquid, thus keeping the marc in an agitated condition, yet, be it observed, liquid is still dropping into the flask, which thus never becomes dry. This process of digestion and repercolation will now go on continuously, but the extraction is hastened if after a column of liquid has filled the inner tube, the apparatus be momentarily removed from the source of heat, when the liquid will quickly pass through the solid into the flask, after which heat can be again applied and the operation repeated. The apparatus may be made of any dimensions; an apparatus four times the size of the diagram has been found convenient for general laboratory use. Having made upwards of two hundred extractions with this apparatus, using different solvents, we have no hesitation in recommending it as an efficient apparatus for accomplishing complete exhaustion in a short space of time.

[*The discussion on this paper is printed at p.* 676.]

THE ASSAY OF NUX VOMICA.*

BY WYNDHAM R. DUNSTAN,
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AND F. W. SHORT,
Assistant-Demonstrator of Chemistry
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It will be immediately obvious that the accurate estimation of the total alkaloids in nux vomica seeds is a matter of great importance, for upon the amount of alkaloid contained in the seeds depends the physiological activity of the tinctures and other pharmaceutical preparations made from them. Considering the fact that nux vomica contains one and probably two alkaloids of potent activity, it is somewhat surprising that so little work has been done in this direction. The present paper is the outcome of an investigation made with the view of perfecting a method which should be at once accurate in result and simple in procedure. Professor Dragendorff† has proposed extraction of the seeds in a finely powdered state by boiling with dilute sulphuric acid. This solution is treated with magnesia until nearly all the acid has been neutralized and evaporated. The mixture, which should be decidedly acid, is extracted with alcohol. The alcohol is distilled off and the aqueous residue shaken with benzene, after which the solution is rendered alkaline and the alkaloids extracted with chloroform or benzene. According to results quoted by the author, from experiments upon known quantities of strychnine and brucine, the process yields very satisfactory results. It seemed to us that a process might be devised which should be less long and intricate than this, by taking advantage of the extreme solubility of strychnine and brucine in chloroform. We first attempted directly to extract the alkaloids liberated by an alkali from the seeds by means of this solvent. In the light of the researches of Gal and Etard,‡ Shenstone§ and others, we avoided prolonged heating of the alkaloids in contact with strong acids and alkalies. Fifty grams of nux vomica were made into a paste with a solution of sodium carbonate containing 50 grams of crystallized sodium carbonate, the mixture being dried over a water-bath. It was then powdered and packed in a percolator and percolated with chloroform, which passed through nearly colourless. This was shaken with dilute sulphuric acid and the chloroform separated; when evaporated it left a large quantity of oil which was not at all bitter, thus indicating that the alkaloid had been completely extracted. The acid solution on standing deposited perfectly white crystals of the acid sulphates of strychnine and brucine. By this means we have obtained large quantities of these salts. It now remained to examine the extent to which extraction had been effected. Already about 200 c.c. of chloroform had slowly passed through the mixture yet the marc was intensely bitter. 200 c.c. more of chloroform were then added, but even after this had percolated the marc was intensely bitter. A smaller quantity of the nux vomica was next operated upon in a similar manner with no better result, 10 grams after percolation with 200 c.c. of chloroform being still intensely bitter. The quantity of sodium carbonate added was now doubled, 10 grams being mixed with 5 grams of nux vomica, chloroform was boiled with the mixture and poured off, the residue being treated successively with more chloroform. In this way six successive 25 c.c. of chloroform were employed and failed to render the marc free from bitterness. Experiments were now made in which calcium oxide and hydrate and barium oxide and hydrate were respectively used in place of the sodium carbonate but with no better result. Finally, the experiments with these different alkalies, including sodium carbonate, were repeated, using the extraction apparatus which we have described in a previous paper. After six hours' extraction the marcs were appreciably bitter. The marc containing sodium carbonate was extracted with dilute sulphuric acid until free from bitterness, the solution rendered alkaline with ammonia and the alkaloid extracted with chloroform; 0·10 per cent. was obtained. When calcium hydrate was used, in one experiment 0·108 per cent. of alkaloid was found remaining in the marc, in another 0·1 per cent. The chloroform which had been used in the experiment with sodium carbonate deposited a soap on cooling; with calcium hydrate this was not noticed. Thus it was clear that another solvent was required in order to completely extract the alkaloid from the seeds.

Five grams of nux vomica prepared with sodium carbonate were extracted with the aid of the extraction apparatus by a mixture of equal parts of chloroform and alcohol. The marc was absolutely free from bitterness; the operation occupying about one hour. The mixture of chloroform and alcohol was shaken with dilute sulphuric acid, two separate ounces of a ten per cent. solution of sulphuric acid being used. The chloroform solution after evaporation left a residue which was distinctly bitter, hence the quantity of acid had been insufficient to extract the whole of the alkaloid from the mixture of chloroform and alcohol. Thus while the difficulty of completely extracting the seeds had been overcome, another difficulty had made its appearance. Experiments were next made where

* Read at an Evening Meeting of the Pharmaceutical Society, February 7, 1883.

† *Die Chemische Werthbestimmung einiger Starkwirkender Droguen.* St. Petersburg, 1874.

‡ *Bull. Soc. Chim.*, [2], 31, 98.

§ *Journ. Chem. Soc.*, xxxix., 453.

extraction was effected, and completely effected, by chloroform containing respectively 40, 30 and 25 per cent. of alcohol. In the first two cases the extraction of the chloroform by dilute acid was effected, but with some difficulty; with the mixture containing 25 per cent. of alcohol it was at once accomplished. After some further experiments upon points of manipulation we adopted the following process. Five grams of the finely powdered nux vomica is made into a paste with a solution containing five grams of crystallized sodium carbonate; the mixture is spread on a plate, and dried over a water-bath. It is then powdered, placed in the extraction apparatus, and exhausted with 40 c.c. of chloroform containing 25 per cent. by volume of alcohol. This operation usually takes between one and two hours. The chloroform is then shaken with 25 c.c. of dilute sulphuric acid (5 per cent.) in a separating funnel, the chloroform is separated, and again shaken with half-an-ounce of the dilute acid. The mixed acid solutions are now filtered, if necessary, rendered alkaline with ammonia, and shaken with chloroform in a separating funnel, the chloroform is then evaporated to dryness over a water-bath, and the residue weighed when constant. If the chloroform is at all turbid it should be filtered before evaporation. In this way the alkaloids are obtained in a fused condition having a pale yellow colour. The residue totally dissolves in dilute sulphuric acid, from which the acid sulphates are deposited in perfectly white crystals. A genuine sample of nux vomica seeds, estimated in this way, yielded 2·67 per cent. of total alkaloid. Dragendorff* found in various specimens from 1·65 to 2·88 per cent. Shenstone† isolated approximately rather more than 2·25 per cent. This process then was, in result, satisfactory; the treatment, however, with sodium carbonate was somewhat tedious, and we therefore commenced a new series of experiments with various solvents to endeavour to extract the alkaloidal salts direct from the seeds.

Five grams of nux vomica were treated in the extraction apparatus with 65 c.c. of alcohol, the operation being allowed to proceed for two hours. The marc was still decidedly bitter, and the alcoholic liquid much coloured. The alcohol was partially distilled off and the residue mixed with chloroform; this solution was now shaken with dilute sulphuric acid and the acid liquid, after the addition of ammonia, again treated with chloroform. The solutions were all much coloured and impure; so, also, was the final residue. Thus alcohol alone is an inefficient solvent, both on account of the length of time required for complete extraction and of the amount of matter other than alkaloid which is dissolved by it. Five grams of nux vomica were extracted with 65 c.c. of chloroform for three hours. The marc was slightly bitter, but it was evident that nearly the whole of the alkaloidal salt had been extracted. The chloroformic solution was treated with dilute sulphuric acid, the mixture being well shaken. The chloroform after evaporation left a large quantity of oil which was not at all bitter, indicating that the sulphuric acid had completely converted the alkaloidal salts into sulphates. The acid solution after the addition of ammonia and agitation with chloroform yielded the alkaloids in a pale yellow fused condition. This experiment had shown that chloroform alone was not a good solvent, and having experienced the difficulty before, an experiment was made in which a mixture of alcohol and chloroform was used. Five grams of nux vomica were exhausted in the extraction apparatus with 40 c.c. of chloroform containing 25 per cent. of alcohol. In less than two hours the seeds were entirely exhausted, the marc being absolutely free from bitterness. The solution was treated with dilute sulphuric acid and afterwards with ammonia and chloroform in the usual way. A nearly white residue of alkaloids was obtained, which totally dissolved in dilute sulphuric acid. It now remained to quantitatively determine whether this residue, which weighed 0·161 gram, consisted wholly of alkaloid. After solution in a small quantity of dilute sulphuric acid, tannic acid was added until a precipitate ceased to fall. The precipitate, after washing, was dissolved in ammonia and shaken with chloroform, when 0·1566 of alkaloid was obtained. This process with tannic acid is not altogether a satisfactory one. It is extremely difficult to completely precipitate the alkaloids by its means from acid solutions, and from the solution of the tannates in ammonia the chloroform separates with much difficulty. These experimental difficulties are sufficient to account for the small loss that occurred in the preceding experiment.

Hence this direct method for the estimation of the alkaloids in nux vomica proved satisfactory. In detail the method is as follows:—5 grams of the finely powdered nux vomica seeds are packed in the inner tube of the extraction apparatus and exhausted by 40 c.c. of chloroform containing 25 per cent. of alcohol. This is usually accomplished in one or two hours. The solution thus obtained is well agitated with 25 c.c. of a 10 per cent. solution of sulphuric acid. The separation of the chloroform is much aided by gently warming the mixture on a water-bath. After repeated agitation the chloroform is separated by means of a funnel and again shaken with 15 c.c. of dilute sulphuric acid. The mixed acid solutions, from which all the chloroform has separated, should, if necessary, be filtered,* then made alkaline with ammonia and shaken with 25 c.c. of chloroform in a separating funnel. After the chloroform has completely separated it is slowly run into a dish, evaporated and weighed after exposure for one hour on the water-bath, by which time it is usually constant in weight. It is sometimes necessary to filter the chloroform after separation from the alkaline liquid. In this way we have estimated the amount of alkaloid contained in samples of the powdered nux vomica of commerce, with the following results:—

I. 2·92 per cent.; II. 3·57 per cent.; III. 3·32 per cent.; IV. 3·38 per cent.; V. 2·56 per cent.

In conclusion, we wish to lay especial stress upon the use of a mixture of chloroform and alcohol for the extraction of the alkaloids, and upon the fact that chloroform is an inefficient solvent when used alone. We have already successfully applied the mixture to the extraction of other alkaloids which are soluble in chloroform, but only with difficulty extracted by it. It is doubtless capable of further extension.

* Work cited, p. 65.
† Paper cited.

* It not unfrequently happens that the acid solution is turbid, not from the presence of solid matter, but from suspended chloroform in a finely divided state. This may be removed by agitation with a small quantity of chloroform. It is manifestly important that the acid solution should be free from impure chloroform.

The process which we have described can probably be advantageously used for the extraction of the alkaloids upon the large scale. The acid sulphates can be prepared in a pure condition by merely shaking the chloroform-alcohol mixture with a small quantity of dilute sulphuric acid and gently warming. Upon cooling, the acid liquid deposits perfectly white crystals of the acid sulphate. The results of our examination of the nux vomica of commerce show that the specimens vary considerably in alkaloidal content. It is extremely desirable that a definite alkaloidal standard should be fixed for seeds intended for pharmaceutical use.

[*The discussion on this paper is printed at p.* 676.]

THE CONSTITUTION OF LIQUOR SODÆ CHLORATÆ.*

BY WYNDHAM R. DUNSTAN,

Demonstrator of Chemistry in the Laboratories of the Pharmaceutical Society,

AND F. RANSOM.

The liquor sodæ chloratæ of the British Pharmacopœia, which is made by passing chlorine gas into a solution of sodium carbonate, is usually stated to contain sodium hypochlorite and chloride, with sodium bicarbonate. From the observations of Williamson (*Mem. Chem. Soc.*, ii., 234), and also from the results of some experiments of our own upon the action of chlorine upon certain metallic oxides and carbonates, we were led to the conclusion that liquor sodæ chloratæ contained no sodium hypochlorite, but hypochlorous acid in the free state. The experiments which are here described were made with the object of ascertaining the validity of this conclusion and of investigating the chemical changes which occur. At the outset a difficulty was encountered by reason of there being no ready and reliable qualitative test for hypochlorous acid when mixed with other salts, especially with hypochlorites and carbonates. After a great number of experiments with various reagents it was found that hypochlorous acid was readily soluble in ether, and that it could be removed from its aqueous solution by means of this solvent. Hypochlorite of sodium is not soluble in ether. It should be noted that free chlorine is also soluble in ether; for this reason when this substance was present, the solution was freed from it by a current of air.

A solution of liquor sodæ chloratæ of the British Pharmacopœia was prepared according to the official directions, with the additional precaution of passing the chlorine through a wash bottle containing a saturated solution of copper sulphate, by which means the gas was freed from the hydrochloric acid with which it is always associated when prepared by the ordinary means.† The solution of liquor sodæ chloratæ was shaken with ether. The ethereal solution possessed a powerful smell of hypochlorous acid and readily bleached a solution of litmus. As a further test of the presence of hypochlorous acid, the action of sodium hypochlorite upon green nickelous hydrate which results in the formation of black nickelic hydrate was employed,

$$2\,Ni(HO)_2 + NaClO + H_2O = Ni_2(HO)_6 + NaCl.$$

For this purpose the ethereal solution was shaken with a dilute solution of sodium hydrate and a few drops of nickelous chloride added. A green precipitate of nickelous hydrate alone was produced, and no change in this was produced even on boiling. The experiment was repeated many times with the same result. As it had already been proved by other tests that hypochlorous acid was present, and having previously noticed that a concentrated solution of hypochlorous acid in ether quickly decomposes, the ether being powerfully attacked, the action of ether upon nickelic hydrate was examined. To a solution of nickelous hydrate sodium hypochlorite was added; a black precipitate of nickelic hydrate was produced. The mixture was shaken with ether, the nickelic hydrate was speedily reduced to green nickelous hydrate. Cobaltic hydrate is by no means so readily reduced by ether, the reaction requiring a considerable time; in fact, the reaction is sufficiently characteristic to constitute a distinguishing test for the two metals. In view of this fact the ethereal solution was treated with sodium hydrate and this solution decanted from the ether. It gave an abundant precipitate of nickelic hydrate on the addition of a nickel salt. It was then evident that hypochlorous acid was a constituent of the solution. It now remained to examine the solution which had been extracted with ether. This had no odour of hypochlorous acid, did not react with a nickel salt and did not bleach a solution of litmus even after the addition of tartaric acid. Sodium chloride and bicarbonate with a trace of sodium chlorate were present. As this solution had been prepared two or three days it seemed likely that this latter constituent had been developed during this time. A solution was therefore prepared and at once treated with ether and the aqueous solution examined; no sodium chlorate was present. On further keeping the first solution, and especially upon exposing to light, more and increasing quantities of sodium chlorate were developed. This substance is most probably formed by the action of hypochlorous acid upon sodium chloride, thus, $6\,HClO + NaCl = NaClO_3 + 3\,Cl_2 + 3\,H_2O$. Williamson has shown that the decomposition is instantaneous upon the application of heat. We have found that only concentrated solutions of hypochlorous acid will act upon sodium chloride when evaporated together, as in dilute solutions the hypochlorous acid is volatilized with the steam. Hence the reaction is not applicable as a general test. Owing to this decomposition liq. sodæ chloratæ is unstable. The above experiments show that the liq. sodæ chloratæ of the British Pharmacopœia is a solution containing free hypochlorous acid, sodium chloride and sodium bicarbonate. The general reaction attending its production is symbolized by the following equation.

$$Na_2CO_3 + Cl_2 + H_2O = HClO + NaHCO_3 + NaCl.$$

Commercial specimens of liquor sodæ chloratæ were now examined. Samples from four of the

* Read at an Evening Meeting of the Pharmaceutical Society, February 7, 1883.

† Throughout these experiments, the chlorine was generated from hydrochloric acid and manganic oxide. It may be here remarked that when chlorine is required free from hydrochloric acid the process with sulphuric acid, sodium chloride and manganic oxide is next to useless unless special precautions be taken. We have noticed that with more than one sample of manganic oxide, when the proportions recommended by Fresenius and others are employed, more hydrochloric acid than chlorine is at first evolved, probably due to deficiency in the strength of the manganic oxide.

principal wholesale houses in London were obtained. They were all alkaline to test paper. On shaking with ether nothing was dissolved from any of the four samples, hence no free hypochlorous acid was present. On the addition of tartaric acid they gave abundant evidence of the presence of sodium hypochlorite, which was also proved by the nickel reaction. Each contained traces of calcium. It was evident that they had been obtained by the decomposition of a solution of bleaching powder with sodium carbonate, and therefore contained sodium hypochlorite but no free hypochlorous acid.

[*The discussion on this paper is printed at p.* 677.]

THE ACTION OF CHLORINE UPON SOLUTIONS OF SODIUM CARBONATE.*

BY WYNDHAM R. DUNSTAN,

Demonstrator of Chemistry in the Laboratories of the Pharmaceutical Society,

AND F. RANSOM.

The general subject of the action of chlorine upon metallic carbonates in presence of water has been studied by Williamson (*Mem. Chem. Soc.*, ii., 234). He concluded that no sodium hypochchlorite was formed, but free hypochlorous acid. In order to chemically explain the results of our former experiments with liquor sodæ chloratæ it was thought desirable to make a complete investigation of the action of chlorine upon solutions of sodium carbonate under different conditions. In all the experiments chlorine which had been purified by means of copper sulphate was employed in the manner described by us in a previous paper. 50 c.c. of a solution containing 25 per cent. of crystallized sodium carbonate, such as is used in the preparation of liquor sodæ chloratæ, were treated with about one hundred bubbles of chlorine gas; the escaping gas was collected and analysed. It consisted mainly of chlorine with a small quantity of carbon dioxide. No effervescence or other visible sign of the evolution of carbon dioxide was observed. The liquid had a characteristic odour quite distinct from that of chlorine in the free state and did not bleach a solution of litmus. The liquid was treated with ether and the ethereal solution after washing with a little water to remove adherent liquid possessed no bleaching properties. We have shown in a previous communication that hypochlorous acid is soluble in ether and sodium hypochlorite insoluble. The extracted aqueous solution was alkaline, and gave the hypochlorite reaction with a nickel salt, but did not bleach until after the addition of tartaric acid. It was then evident that this solution contained sodium hypochlorite but no free hypochlorous acid. We have found that sodium hypochlorite is incapable of bleaching in the presence of much free alkali, whether it be in the form of hydrate or carbonate; after the addition of an acid the usual bleaching effects are observed. Throughout these experiments the acid used for this purpose has been tartaric acid, for this acid does not liberate chlorine or an oxide of chlorine from sodium chlorate, which was frequently present in the solutions.

Fifty c.c. of sodium carbonate solution of the same strength as the preceding were treated with about three hundred bubbles of chlorine. No effervescence occurred. After about one hundred bubbles of gas had passed the small quantity of escaping gas was collected and analysed; it consisted principally of chlorine with some carbon dioxide. The solution was treated with ether in the manner before described. No free hypochlorous acid was found, but sodium hypochlorite in larger quantity than in the first experiment.

Fifty c.c. of the solution of sodium carbonate were treated with about five hundred bubbles of chlorine gas, and as before no effervescence occurred. After three hundred bubbles of gas had passed the escaping gas was collected and analysed; a small quantity of carbon dioxide was obtained. The solution was only faintly alkaline and bleached powerfully. A rapid current of air was passed through the liquid to remove the small quantity of free chlorine contained in it, and the solution shaken with ether. The ethereal solution instantly bleached a solution of litmus. The aqueous solution was freed from hypochlorous acid by repeated treatments with ether; the aqueous liquid bleached litmus solution rapidly, especially after the addition of tartaric acid. In this solution, both sodium hypochlorite and free hypochlorous acid were contained.

Fifty c.c. of the sodium carbonate solution were acted upon by about eight hundred bubbles of chlorine gas; no effervescence occurred, and the escaping gas contained only a small quantity of carbon dioxide. The solution had the physical properties of liquor sodæ chloratæ. It bleached litmus powerfully. After a current of air had been passed through the liquid it was shaken with ether; the ethereal solution bleached, but the extracted aqueous solution did not, even after the addition of tartaric acid. This liquid upon analysis was found to contain sodium bicarbonate and chloride. Thus, the original liquid contained hypochlorous acid, but no sodium hypochlorite.

Fifty c.c. of the sodium carbonate solution were treated with chlorine gas in larger quantity than in the preceding experiment. Effervescence commenced, and at this point the escaping gas was collected and found to consist entirely of carbon dioxide. As more chlorine was passed through the liquid the effervescence increased; the gas evolved was wholly carbon dioxide. Effervescence having ceased, the liquid was examined after the passage of air and found to consist of free hypochlorous acid which was extracted by ether, the remaining aqueous liquid containing sodium chloride with some sodium chlorate.

The experiments above detailed have been repeated many times with the same results. It was always noticed that no effervescence occurred until a large quantity of chlorine had been passed through the liquid.

The action of chlorine upon stronger solutions of sodium carbonate was now studied. A saturated solution of sodium carbonate was treated with a small quantity of chlorine; carbon dioxide was evolved in quantity rather greater than with more dilute solutions. The solution was analysed by means of ether as before described and with the same result, the formation of sodium hypochlorite without any free hypochlorous acid. On passing more chlorine through the liquid a precipitate was observed to form. At this point the reaction was stopped and some of the solution examined after filtration. It still contained only sodium hypo-

* Read at an Evening Meeting of the Pharmaceutical Society, February 7, 1883.

chlorite. The precipitate was examined and found to be sodium bicarbonate. On continuing the passage of the chlorine the precipitation increased, and when this had ceased the chlorine gas was allowed to pass until effervescence was first observed. The solution now, after removal of the free chlorine, contained no sodium hypochlorite, but hypochlorous acid in the free state. The aqueous liquid contained sodium chloride with some chlorate.

When chlorine was again passed through the liquid copious effervescence occurred and the precipitate of sodium bicarbonate rapidly disappeared, the solution finally being found to contain free hypochlorous acid, sodium chloride and chlorate. Experiments were now made at low temperatures and it was found that at 0° C. the reaction which occurred was the same as that at ordinary temperatures. At 100° C. it was found that the product consisted entirely of chloride and chlorate of sodium, carbon dioxide being evolved from the commencement of the reaction.

The first action of chlorine, then, upon a solution of sodium carbonate at ordinary temperatures and at lower temperatures, even to the freezing point of water, results in the production of sodium hypochlorite, chloride and bicarbonate. It may be represented thus:—

(1) $Cl_2 + Na_2CO_3 = NaClO + NaCl + CO_2$

(a) $CO_2 + H_2O + Na_2CO_3 = NaHCO_3$.

When more chlorine is passed through this solution the sodium bicarbonate is not appreciably affected, but the sodium hypochlorite is decomposed with the production of hypochlorous acid. We here assume that sodium hypochlorite is at first formed as the simplest hypothesis, but our experiments do not negative the possible existence of intermediate or double salts. The only two agents present which would affect the decomposition of the sodium hypochlorite are carbon dioxide and chlorine. The action of the former would result in the reproduction of sodium carbonate, an improbable result, and for which there is no experimental evidence in the present case. Williamson has shown that chlorine is capable of decomposing a solution of bleaching powder which contains calcium hypochlorite with the formation of hypochlorous acid, thus— $Ca\,2ClO + 2Cl_2 + 2H_2O = CaCl_2 + 4HClO$. We, therefore, made some experiments to discover whether this reaction obtained with sodium hypochlorite. A solution of sodium hydrate was treated with chlorine gas, and after a current of air had been passed through the liquid the solution was shaken with ether; the ethereal solution did not bleach, but the aqueous solution possessed strong bleaching powers. The solution was now treated with excess of chlorine. It possessed the very powerful and characteristic odour of hypochlorous acid. After passing air through the liquid it was treated with ether; the ethereal solution possessed all the properties of hypochlorous acid. The extracted aqueous solution contained sodium chloride and chlorate, but no sodium hypochlorite. Thus it was conclusively shown that chlorine possessed the power of decomposing sodium hypochlorite, forming hypochlorous acid. It now remained to examine the action of chlorine upon a mixture of sodium hypochorite and bicarbonate. Chlorine was passed through a solution containing about an equal quantity of these two salts No effervescence at first occurred and only a small quantity of carbon dioxide was found in the escaping gas. Just before effervescence occurred the passage of the chlorine was stopped and the solution analysed; it contained much free hypochlorous acid which was extracted by ether, leaving sodium chloride and bicarbonate with a trace of sodium hypochlorite in the aqueous solution. The further action of chlorine upon solutions of sodium carbonate may then be represented thus—

(2) $NaClO + Cl_2 + H_2O = NaCl + 2HClO$.

The solution at this stage represents the liquor sodæ chloratæ of the British Pharmacopœia, and the above equations explain the genesis of each of its constituents,—hypochlorous acid, sodium chloride and bicarbonate. If more chlorine be now passed into the solution effervescence occurs, owing to the decomposition of the sodium bicarbonate, thus—

(3) $Cl_2 + NaHCO_3 = NaCl + HClO + CO_2$.

Thus the final constituents of the solution are sodium chloride and hypochlorous acid. The liquid also contains sodium chlorate; this is doubtless produced by the action of hypochlorous acid upon sodium chloride, thus—

$NaCl + 6\,HClO = NaClO_3 + 3\,Cl_2 + 3\,H_2O$.

When chlorine is passed into a boiling solution of sodium carbonate, the reaction is as follows:—

$3\,Na_2CO_3 + 3\,Cl_2 = 5\,NaCl + NaClO_3 + 3\,CO_2$.

This reaction may be considered to take place in two stages:—

(1) $Na_2CO_3 + 2\,Cl_2 + H_2O = 2\,NaCl + 2\,HClO + CO_2$.

(2) $NaCl + 6\,HClO = NaClO_3 + 3\,H_2O + 3\,Cl_2$.

We are at present engaged in studying the action of chlorine upon certain metallic oxides and carbonates, and have already obtained some interesting results.

[*The discussion on this paper is printed at p.* 677.]

NEW PROCESS FOR THE EXTRACTION OF FISH OIL.*

A foreign exchange, speaking of the processes of extracting fish oil, invented by Messrs. Moride and Joulie, says:—The oil in fishes is contained in the network of the tissues, and cannot be liberated until they are destroyed, either by putrefaction or by the application of heat. In both these cases, the oil is subjected to an alternative process of a more or less decided character. It has, however, been noticed that under the influence of certain substances, the albuminoid matters, which form the tissues, contract, become tighter, and cause the oil to exude in a cold state, and in a condition of remarkable purity. The substances which produce this effect are notably lime, perchloride of iron, the sulphates of peroxide of iron, and the chlorides and sulphates of alumina. Of all these reagents, the salts of iron produce the best results, because they cause the disinfection of the substances to which they are applied, and, at the same time, secure them against putrefaction.

In the industrial application of this theory to fish, the inventors sprinkle it with five per cent. of its own weight of a solution of perchloride or persulphate of iron at 45° Baumé; it can then be easily kept three or four days, either entire or in pieces, without undergoing any alteration. It is passed into a machine which crushes it, and reduces it to a thick paste, which is received in bags and taken to the press. A rather large quantity of water is forced out, bringing with it the liquid oil contained in the fish. The cake which is withdrawn from the press dries readily, becomes very friable, and is easily pulverized. It still contains a small quantity of fatty mate-

* Reprinted from *New Remedies*, February, 1883.

rial, less liquid than oil, which can be extracted by a solvent, such as benzin or carbon disulphide. The greater part of this fatty material can also be obtained by submitting the cake to a second pressure between heated plates of metal.

The cake, freed from oil, dried and pulverized, forms an excellent fertilizer, containing 7 to 10 per cent. of nitrogen and 10 to 15 per cent. of phosphate of lime, according to the substance which has been employed in the anterior processes.

CONDENSED WHEY. A NEW INDUSTRY AND A NEW FOOD PRODUCT.*

BY PROF. ALEXANDER MUELLER.

Whey, which is a bye-product in the manufacture of cheese, contains about an equal quantity of milk-sugar and albumen, as well as a considerable quantity of salts and particles of caseine and butter-fat that have escaped being made into cheese. Only a very small percentage of all the whey produced in Germany is utilized directly for human nutriment, either as drink or as an addition to food and pastry, nor is much used for making milk-sugar. The greatest part of it is used as food for animals—hogs, calves, cows, and even horses—at least among country cheese-makers. Where large cheese factories are situated in cities, a considerable quantity runs off in the gutters and sewers.

The value of whey for feeding cattle and hogs is scarcely higher as an average than one-half cent. per gallon; its value as human food, on the other hand, is at least six times as high. This disproportion between supply and demand has frequently attracted the attention of milk producers and economists generally, without as yet, however, having met with any satisfactory solution.

The chief difficulty lies in the great dilution of nutriment in the whey, and the consequent tendency to sour or putrefy. The first step toward a better utilization of whey must be taken in the direction of concentration. As in the case of most other kinds of food, concentration will improve its keeping qualities.

It is a fact that the small dairymen of Norway have been wont from time immemorial to boil down the greater part of their whey, sweet as well as sour, more or less to a "mesost" or "prim," sometimes alone, sometimes with the addition of buttermilk, or even of cream. The boiling down in open vessels over an open fire of course demands the most painful attention to prevent burning, which would spoil the taste of the whole lot, and make it uneatable, for us at least. Then, too, the consumption of coal is so great as to make the product unreasonably costly. The use of a water or steam bath would overcome the former of these objections, but not the latter. A solution of the problem must be sought in the use of a vacuum apparatus, which, assuming the operations to be conducted on a large scale, guarantees at once the cheapest and best preparation.

After many fruitless attempts, an opportunity was afforded me last autumn, at the Cismar Condensed Milk Factory, in Eastern Holstein, to evaporate whey in a vacuum. But before the experiment had been made there, the firm of Heckmann, in Berlin, kindly placed at my disposal a suitable vacuum apparatus, with an arrangement to prevent foaming over, and all its attachments and service. I first made use of it last January. Part of the whey was evaporated until it just began to crystallize when cold; another part to a stiff dough, which, in a few days, hardened to a solid cake.

In both cases, but especially in the latter case, a very permanent product was obtained, which could be kept for months in pure, dry air without spoiling or moulding. Whey condensed *in vacuo* is better for making milk-sugar than any other preparation. For daily use in the household, it is capable of the greatest variety of uses for food and drink, the most important of which, it seems to me, is in making different kinds of pastry, for which purposes its milk-sugar and milk salts especially fit it, and this is the easiest way to utilize them in nourishing and sustaining large classes of people. C. Becker made experiments on baking with whey concentrated on a water-bath, while Bolle used a portion of the whey extracts obtained by me in Heckmann's factory here. These bakery experiments were so satisfactory that Bolle decided to have a vacuum apparatus set up in his own place, and to offer his whey to the Berlin public in the form of bread or cake.

In the course of the following winter and spring, Bolle put up the necessary apparatus, and having secured regularity in working the process, he began the regular manufacture of whey-rye bread, and of two kinds of wheat bread, one a fine article in rolls, made of the best wheat flour, with the addition of milk, butter, eggs, etc., the other plain bread in round loaves for daily use, without the addition of the more expensive ingredients. The public seems to have a taste for this new form of bread, and the example is worthy of imitation in other places.

By careful treatment of the whey, and if the bakery were properly conducted, I have not the slightest doubt that all large cheese factories which are situated in towns could make a profitable use of their now worthless whey by evaporating and baking it, and at the same time contribute to the sustenance of the people.

Besides this, cooks and housekeepers would soon learn to use extract of whey in the preparation of their daily food, both to improve the flavour and render it more digestible.

The fear that there will soon be too much whey extract made and offered to the public, is met by the idea that the larger cheese factories will in time cease to make use of thin or skimmed milk, but to sell it as condensed skimmed milk, as this would be more profitable than condensing the whey.

* Read before the fifty-fifth meeting of German Naturalists, etc., at Eisenach, 1882. From *Chemiker Zeitung* and *St. Louis Druggist*. Reprinted from *New Remedies*, February, 1883.

TOOTH WASH.*

Tooth washes prepared with soap bark as a base are not injurious to the teeth. Among the published formulæ, we select the following, giving the proportions according to Hager:—

Bennet's Tooth Wash.

Quillaia, in moderately coarse powder	20 parts.
Glycerin	20 „
Diluted alcohol	q.s.
Oil of gaultheria	q.s.
Oil of peppermint	q.s.

Macerate the quillaia with the glycerin and 180 parts of diluted alcohol, and enough of the oils to flavour the mixture, for twenty-four hours, occasionally agitating. Then filter and add enough diluted alcohol to make the product weight 200 parts.

Meyers' Tooth Wash.

Quillaia, in moderately coarse powder	50 parts.
Peppermint water	300 „
Alcohol	300 „

Macerate for a few days, then add

Cochineal, powdered	1 „
Peppermint water	100 „
Glycerin	100 „
Oil of gaultheria	1·5 „

Again macerate during one day, occasionally shaking. Finally add

Peppermint water, enough to make	1000 parts.

Lastly filter.

* From *New Remedies*, February, 1883.

The Pharmaceutical Journal.

SATURDAY, FEBRUARY 17, 1883.

THE REGISTRAR'S REPORT.

THE Report on the state of the Registers of Pharmaceutical Chemists and Chemists and Druggists, presented annually by the Registrar under the Pharmacy Act, 1868, to the Council of the Pharmaceutical Society at its meeting in February, offers a convenient opportunity to all interested in the welfare of pharmacy in Great Britain for observing the effect of existing legislation in controlling the number of persons carrying on the business of a chemist and druggist in this country. Especially is this the case with the Report presented next after each of the general expurgations of the Register, such as have hitherto been effected at intervals of two years; because so imperfectly is the provision of the Act as to the communication of information concerning the death of registered persons carried out by registrars of deaths throughout the country, that the Register quickly becomes cumbered with a number of names that ought to be removed. For instance, the recent exercise by the Registrar of the power conferred on him by the Act, led to the removal of 253 names of persons to whose registration address the legal number of registered letters had been addressed and had been returned through the dead letter office.

The Report shows that the total number of persons whose names are included in the new Register of Chemists and Druggists is 13,447; this is 208 less than the number in the Register for last year, and 15 less than in that for 1881. From this it would appear that the number of persons who during the last two years have passed the qualifying examinations has been barely sufficient to counterbalance the removals from the Register occurring during the same time through deaths and other causes. Of course this is explained by the fact that the additions have necessarily been limited mainly to examined persons, whilst the proportion of deaths has naturally been much higher among those who were registered in virtue of having been in business before the passing of the Pharmacy Act, 1868. The result is that of the 13,447 persons whose names are now on the Register, 4798, or 35·68 per cent., have passed at least the Minor examination.

Turning to the smaller Register of Pharmaceutical Chemists, we find that here also there has been a decrease in the gross total, the number in the Register for the present year being 2275, against 2308 in those for 1881 and 1882. This apparently disproportionate decrease in so important a class will naturally attract attention and provoke anxiety, or may even lead, as in former years, to assumptions as to the looming failure of the efforts of the Pharmaceutical Society to establish a class of pharmacists who have voluntarily qualified themselves for carrying on their calling to an extent beyond that which is required by law. Should the Bill which it is intended to introduce into Parliament in the coming session pass into law the whole position will be altered, and it will be hardly worth while to discuss the pros and cons of this question. But, meanwhile, we are inclined to think that an undue importance may be attributed to any absolute decrease in the gross total of pharmaceutical chemists, since, as we have pointed out before, the decrease is considerably affected by the presence on the Register of a large number—still amounting to more than one third of the whole class—of persons who were admitted as pharmaceutical chemists in virtue of having been in business on their own account at least thirty years ago, whilst the class is entirely dependent for recruits upon persons passing the Major examination. We are of opinion that a truer estimate of the probable strength to which the class of pharmaceutical chemists would attain under present conditions may be formed by taking into account in the calculation only the numbers affecting those who have passed the Major examination. More than thirty-six years have now elapsed since the first Major certificates were signed, and this is a sufficiently long period of time to allow of some approximation to an average in gains and losses. Calculating upon these lines we find that the number of Major men steadily increases year by year, being 1511 in the new Register against 1498 in 1882, and 1450 in 1881. Last year 40 persons passed the Major, and the foregoing figures show that these were sufficient to replace the loss in examined Pharmaceutical Chemists and to increase the number by 13. Therefore these figures point to the conclusion that the number who passed the Major examination last year would have been equal to maintaining the equilibrium in a body of 2000 men, and assuming that the examination is usually passed early in life this is not far from what might be expected.

For convenience of comparison we append the figures in a tabular form as in previous years:—

	January 1, 1882.			January 1, 1883.		
	Number.		Per cent.	Number.		Per cent.
Pharmaceutical Chemists:—						
Examined . .	1498	2308	10·97	1511	2275	16·92
Non-examined	810		5·93 16·90	764		
Chemists and Druggists who have passed the Minor only . .	3011		22·05	3287		24·44
Remainder, including those who have passed the Modified . .	8336		61·05	7885		58·64
Total	13,655		100·00	13447		100·00

The simultaneous presentation of statistics as to the numerical strength of the Pharmaceutical Society enables us also, as in former years, to call attention to some points bearing upon the extent to which the Society is representative of the whole body of chemists and druggists. In the first place it appears that the gross number of registered chemists and druggists connected with the Society at the beginning of the present year, either as Members or Associates was 4592, or 34·15 per cent. of the whole number on the Register. This shows a decrease of 15 in the absolute number as compared with the previous year, when it was 4607; but in consequence of the smaller number on the Register the relative proportion, which last year was 33·73 per cent., is higher by 0·42 per cent. The gains and losses are unequally distributed; but they are instructive as indicating that the point has been passed at which recruits from the unexamined class will be sufficient to replace losses of unexamined Members, and that under present conditions the maintenance of the numerical strength of the Society will depend upon a sufficient proportion of the men examined year by year joining it. It will therefore be interesting to see how far this requirement has been satisfied during the last twelve months. The decrease has been entirely confined to the two classes of Members, being 51 in the class of Pharmaceutical Chemists and 9 in that of Chemists and Druggists. The latter may be disregarded altogether in discussing this point, since this decrease must go on in an increasing ratio, and the disappearance of the entire item of 779 is only a question of time. The decrease of 51 in the class of Pharmaceutical Chemist Members is much more serious, especially in the face of the fact that the number elected or restored to membership was 43, and of these 40 would appear to have been examined men, or exactly the total number of persons who passed the Major examination in 1882. It will be seen from the preceding table that the number of non-examined Pharmaceutical Chemists on the Register was during the year 1882 reduced by 46,—from 810 to 764;—and since the roll of members must necessarily have been diminished to this extent, it follows that the accession to the Society of a number of examined men equal even to the total who passed the Major was insufficient by 5 to compensate the losses to the Society through deaths and secessions of examined men during the same time. It is worth mentioning, however, that 74 per cent. of all the holders of Major certificates at the present time are Members of the Pharmaceutical Society. Turning to the two classes of Associates the results are more satisfactory. The important class of Associates in Business, who, if the projected Bill passes in its present form, will become Chemist and Druggist Members, and eligible as members of Council, continues to increase steadily, the number being 1107 against 1069 last year; whilst the Associates not in Business, who also would have the option of becoming Members, have increased from 817 to 824.

The following is a tabular comparison of the numerical strength of the Pharmaceutical Society with the number on the Registers:—

	January 1, 1882.		January 1, 1883.	
	No.	Per cent of whole.	No.	Per cent of whole.
Pharmaceutical Chemists, Members of the Society .	1933	83·75	1882	82·72
Other Registered Chemists and Druggists connected with the Pharmaceutical Society	2674	—	2710	—
Total number of Registered Chemists and Druggists connected with the Pharmaceutical Society. . .	4607	33·73	4592	34·15
Registered Apprentices subscribing to the Society .	1046	—	1037	—

THE CHEMISTS' ASSISTANTS' ASSOCIATION.

It speaks well for the *esprit de corps* prevailing among the junior pharmacists in the metropolis that recently, at least, so keen an appreciation has been shown of the opportunities afforded them for social intercourse. The Dinner on Wednesday evening, in connection with the Chemists' Assistants' Association, proved no exception to the rule, about one hundred and thirty members and friends having been present on that occasion, under the presidency of Mr. M. Carteighe, President of the Pharmaceutical Society.

After the usual loyal toast of the Queen and Royal Family had been duly honoured, the Chairman proposed "The Medical Profession," coupling with it the name Dr. J. Langdon Down, as linking together in his experience medicine and pharmacy. In acknowledging the compliment, Dr. Langdon Down referred to a time when he unsuccessfully sought an engagement in London as a chemist's assistant, and spoke of his training in the School at Bloomsbury Square as awakening in him a love for science that had been very helpful to him in his medical studies. "The Pharmaceutical Society" was proposed in an able speech by Mr. Parkinson, who, quoting the Charter as to the four objects for which the Society was established, expressed an opinion that these had been steadily kept in view. The toast was acknowledged in eloquent terms by Mr. S. R. Atkins, Vice-President of the Pharmaceutical Society. The toast of the evening, "The Chemists' Assistants' Association," was proposed by the Chairman, who in the course of his remarks referred to the proposed Pharmacy Bill as closely affecting the future interests of assistants, and appealed to his hearers to consider it carefully, in a broad and liberal spirit, and then, if they approved of it, to give the Council their hearty support. The toast was coupled with the name of the President of the Association, Mr. W. A. Wrenn, who replied. The other toasts were, "The Pharmaceutical Press," proposed by Mr. Winfrey and acknowledged by Mr. Wootton; "The Visitors,"

proposed by Mr. H. H. Millhouse and acknowledged by Mr. R. W. Giles; and "The Chairman," proposed by Mr. W. H. Kerr. It is only due to the Dinner Committee to say that all the arrangements were excellent, and that the meeting was successful in every respect.

THE REGISTERS FOR 1883.

It will be seen from the advertisement that has appeared that the Registers of Pharmaceutical Chemists and Chemists and Druggists for 1883 are now ready and that copies may be had from the Registrar. It may be mentioned that the preliminary matter includes the latest addition to the Poison Schedule, and that in accordance with a suggestion made at the last Annual Meeting a summary has been prepared and inserted of all the regulations required by the Pharmacy Act, 1868, to be observed in selling by retail, and in dispensing "poisons."

At a recent meeting of the School of Pharmacy Students' Association, the new Faure-Sellon-Volckmar Accumulator was exhibited to illustrate a paper by Mr. H. Allen, B.Sc. As an example of its power a piece of platinum wire 9 inches long and $\frac{1}{8}$th inch thick, weighing 637·5 grams, was maintained at a bright red heat by one cell. Two cells were sufficient to raise the same platinum wire to a white heat. Each of the cells weighed about 15 pounds and contained nearly 1,000,000 foot pounds of energy.

* * *

There is to be an International Exhibition in Calcutta, under the patronage of the Viceroy, the day fixed for the opening being the 4th of December next. It is to be held in the "India Museum," a magnificent pile of buildings in the centre of the city, the use of which and of the adjoining grounds has been granted by the Indian Government, together with a lac and a half of rupees to defray the expenses of the Indian court. Full information concerning details may be obtained by persons resident in this country on application to the official agent, Mr. W. P. Dilworth, 4, Westminster Chambers, S.W.

* * *

At the quarterly examinations held under the Pharmacy Act of Victoria in December five candidates out of six passed the Major (there is no Minor) and became entitled to registration as Pharmaceutical Chemists. Three other persons acquired the same right by passing a "Modified" examination.

* * *

The Pharmaceutical Society of Victoria held its annual dinner in aid of its Benevolent Fund on the 13th of December. Among the toasts was one to the "Pharmaceutical Society of Great Britain and Kindred Societies." We regret to notice that Mr. Bosisto, who has presided over the Pharmacy Board since the passing of the Victoria Act, announced on that occasion his intention of retiring.

* * *

Vigorous attempts are being made in the United States to deal with the practice—not unknown in this country—of certain retailers making the sale of proprietary preparations at little or no profit a leading feature of their businesses as a "draw." A committee appointed by the Massachusetts Pharmaceutical Association has issued a circular calling upon the manufacturers of such articles to supply them only to such jobbers as will engage to adopt a "rebate" system similar to that which has been found to work well in the wholesale trade. It consists in invoicing the goods at an advance of 50 per cent. on the actual price and deducting a corresponding amount on payment of the bill, only when the retailer guarantees in writing that he has not and will not sell, directly or indirectly, to consumers below the marked price.

* * *

In a report recently presented to the Illinois Pharmaceutical Association by its Committee on Trade Interests attention is called to the prevalence of the practice of "cornering," or securing the control of the supply of a drug, in order to raise the price unduly. It was mentioned, as an instance, that the quotations for cubebs represented at that time three times the actual value of the drug.

* * *

The number of students attending the present sessions of the different colleges of pharmacy in the United States is, according to the *Pharmaceutical Record*, 1454. They are distributed as follows:—Albany, 31; Chicago, 160; Cincinnati, 94; Louisville, 57; Maryland, 80; Massachusetts, 112; National, 33; New York, 300; Philadelphia, 400; Pittsburg, 41; St. Louis, 96; San Francisco, 50. No return had been received as to the number attending Iowa College.

* * *

The editor of the *Chemiker-Zeitung*, Dr. Krause, calls special attention to a suggestion that has been made for the erection of a memorial to the late Dr. Friedrich Wöhler.

* * *

The "adulterated quinine" sensation in Paris has undergone further development. According to the *Times*, some of the French newspapers, in an excess of patriotic zeal, attributed the fraud to "a chemical manufactory at Milan, which some time ago amalgamated with a German one." It turns out, however, that the substitution was effected in Paris, and the foreign "chemical manufactory" so significantly pointed at is having recourse to the law courts to rehabilitate its character.

* * *

The first of a series of six lectures on the Applications of Electricity, for which arrangements have been made by the Council of the Institution of Civil Engineers, was delivered on Thursday evening, by Mr. W. H. Preece, the subject being "The Progress of Telegraphy." The other lectures of the series will be, on March 1, "Telephones," by Sir F. Bramwell; March 15, "The Electrical Transmission and Storage of Power," by Dr. C. W. Siemens; April 15, "Some Points in Electric Lighting," by Dr. J. Hopkinson; April 19, "Electricity Applied to Explosive Purposes," by Professor F. A. Abel; and May 3, "Electrical Units of Measurement," by Sir W. Thomson.

* * *

At the meeting of the Chemists' Assistants' Association to be held on Wednesday evening next, a paper will be read on "Lithiæ Citras," by Mr. C. Thompson.

Transactions of the Pharmaceutical Society.

EVENING MEETING.

Wednesday, February 7, 1883.

MR. MICHAEL CARTEIGHE, PRESIDENT, IN THE CHAIR.

An Evening Meeting of the Pharmaceutical Society was held on Wednesday last, February 7. The chair was taken at half-past eight o'clock.

The minutes of the previous meeting having been read and confirmed, the first paper read was entitled—

A Research on the Alkaloid Gelsemine and some of its Crystalline Salts.

BY A. W. GERRARD, F.C.S.

The paper was printed last week (see p. 641), and gave rise to the following discussion:—

The PRESIDENT, in proposing a vote of thanks to Mr. Gerrard, said that it was obvious that the paper would not bear so much discussion as some of the papers which were read. At present Mr. Gerrard had the field all to himself.

Professor ATTFIELD said that the paper was one into which a great deal of labour had been thrown, and he hoped that it would not pass without those present showing that they appreciated it. Perhaps they would especially appreciate the new departure which Mr. Gerrard had made in his experiments. As far as could be judged, it appeared that the probabilities of truth lay with Mr. Gerrard rather than with Professor Sonnenschein. When two men were working at the same drug, and each got an alkaloid, and when one obtained it quite white, while the other got it slightly coloured, and when one obtained it in such a state that it gave no reaction with that great charrer of many organic substances, namely, sulphuric acid, and was not apparently acted upon by nitric acid, while the other got it in such a state that it was affected to some extent by those reagents, the probabilities lay with the investigator who got it in the white state in which it was not so attacked. Certainly Mr. Gerrard's figures, which justified his formula, were much nearer to those required by his formula than to those required by the formula of Professor Sonnenschein. Even if they supposed that Professor Sonnenschein's alkaloid was burnt in such a way that the oxidizer yielded a little water, as such materials commonly did, and that, therefore, his formula should contain less hydrogen than it did, and thus come somewhat nearer to Mr. Gerrard's formula, so that instead, say, of the formula being $C_{11}H_{19}NO_2$ as given by Professor Sonnenschein, it should be $C_{11}H_{12}NO_2$; even then the numbers which Mr. Gerrard got were much nearer to the formula which he suggested than to that suggested by Professor Sonnenschein, or that which might be inferred, assuming that he had got too much hydrogen. Mr. Gerrard's formula required 70·6 per cent. of carbon, and he got 70·3. Professor Sonnenschein's formula required only 67 per cent. of carbon. He (Professor Attfield) took the carbon for the purpose of illustration. Even admitting that there was too much hydrogen, contributed by the process rather than by the alkaloid, the formula $C_{11}H_{12}NO_2$ would require 69 per cent. of carbon, while Mr. Gerrard obtained 70·3 per cent. He hoped that Professor Sonnenschein or Dr. Wormley would go into the question. One matter he would suggest should occupy the attention of investigators, namely, a careful consideration of the set of reactions which pointed to a somewhat close analogy between this alkaloid and strychnine.

Mr. MARTINDALE said that having tried some years ago to repeat Dr. Wormley's experiments he had been struck with the great affinity which gelseminic acid had for gelsemine. He had little doubt that the product which had been in the market, and had been known as Sonnenschein's gelsemine, contained gelseminic acid as an impurity. It would be a great advantage to oculists and others to have the alkaloid free in a crystalline condition and its salts as Mr. Gerrard had produced them.

The PRESIDENT proposed a vote of thanks to Mr. Gerrard, and associated with the proposition the names of Professor Rouch and Dr. Tweedie.

The next paper was on—

Aromatic Spirit of Ammonia.

BY DR. THRESH.

The paper is printed on p. 661, and gave rise to the following discussion.

Mr. MARTINDALE said that he had twice suggested in the *Pharmaceutical Journal* that sal volatile might be made by admixture, without distillation. Referring to the British Pharmacopœia formula Dr. Thresh had stated in his paper that the official quantity of carbonate of ammonia refused to dissolve in the requisite amount of water and solution of ammonia without the aid of heat. He had, however, found that it dissolved perfectly; in fact, he had found that it would dissolve in a third of the quantity of water there ordered. He had 5 drachms of water with ¼ ounce of carbonate of ammonia; he would add to it 1 drachm of liquor ammon. fort., and it would be seen that it dissolved immediately, although he only used one-third the pharmacopœial proportion of water. The process in the British Pharmacopœia theoretically produced only normal carbonate. In Dr. Thresh's process the result would contain about four times as much caustic ammonia as was necessary for this purpose, and very much more than was contained in the United States Pharmacopœia preparation. He arrived at that fact simply by calculation.

The CHAIRMAN asked whether Mr. Martindale was prepared to say that his calculations were right. The basis of the paper was experimental evidence, and Dr. Thresh stated that the result which Mr. Martindale alleged did not occur.

Mr. MARTINDALE said that when the carbonate of ammonia was finely powdered and mixed in the British Pharmacopœia proportions, leaving out the spirit, and adding only a third of the water, it made a perfect solution even in the cold. The United States Pharmacopœia gave a preparation containing normal carbonate of ammonia with very little free ammonia; so that it was much more palatable than the British Pharmacopœia preparation, which contained a large quantity of free ammonia owing to loss of CO_2 during distillation. He had shown this experiment, because it referred to a paper he had published some years ago (*Pharm. Journ.*, 1871, p. 704), giving results obtained in testing some samples of aromatic spirit of ammonia. He at that time suggested three experiments. One was that which he had now performed. Another was performed with double the quantity of water; and in the third there was three times the quantity of water. The quantities of water, carbonate, and liquor ammon. fort. were those of the British Pharmacopœia, less the spirit. It was possible that there might not be an intimate chemical combination between the official carbonate and the liquor ammonia, but the solution was perfect. He knew that normal carbonate of ammonia dissolved very slightly in rectified spirit, and as soon as the solution was added the normal carbonate was precipitated.

Professor ATTFIELD: Is it normal?

Mr. MARTINDALE said that he supposed that it was normal as no CO_2 was given off. The normal carbonate

was very soluble in water. In dissolving the arbonate of ammonia he had noticed that if he used only half the quantity of water which was necessary to dissolve it the salt split up in the process of solution, and he got a solution which left behind the acid carbonate. If he put to this, as he had done in his experiment, the small quantity of liquor ammonia which was necessary to dissolve it, the whole would dissolve in less than three volumes. The carbonate of ammonia of the British Pharmacopœia only dissolved in the proportion of one part in six. His idea was that this preparation should not contain so much caustic ammonia as Dr. Thresh suggested, and be less alcoholic. It would, no doubt, be a great advantage to have a preparation which would contain definite quantities of carbonate of ammonia and free ammonia in solution. The preparation which was made by admixture certainly had the advantage; but the carbonate of ammonia of commerce was not so pure as it ought to be, and some of its impurities were kept back by distillation. The fault he found with the paper was that Dr. Thresh made the preparation to contain too much free ammonia gas.

Mr. TANNER said that some years ago he made a great many experiments on this subject, and the results which he obtained pointed to the conclusions to which Dr. Thresh had arrived. The quantities of official carbonate of ammonia and ammonia ordered in the British Pharmacopœia were in the proportions to produce normal carbonate. He found that when they were in the still, and before distillation commenced, a considerable effervescence took place, and there was a consequent loss of carbonic acid. On estimating the amount of carbonic acid in the distillate he found that exactly 50 per cent. of the carbon dioxide was lost. The proportions ordered in the British Pharmacopœia were calculated to produce about 8 per cent. of normal carbonate of ammonia. If the distillation was conducted carefully and in small quantities about 4 per cent. would be found. The other 4 per cent. was dissociated. Its ammonia existed as free ammonia in the distillate, and its carbonic acid had disappeared.

Mr. SCHACHT said he had for some years manufactured a "sal volatile" without distillation for sale as "sal volatile," and a spiritus ammoniæ aromaticus, according to the Pharmacopœia, for dispensing. The constancy of strength in the former article was, he thought, an important advantage; and in respect of one alleged disadvantage, namely, that it gradually became coloured, he did not find that this invariably occurred. Perhaps the development of colour might depend upon the age of the samples of essential oils employed. He felt gratified to Dr. Thresh for having discussed the subject in so practical a manner, and for having offered so useful a suggestion to future Pharmacopœia compilers. Upon one point he did not quite agree with Dr. Thresh, namely, as to the necessity of employing heat in the solution of the ammonia salt. It is quite true that if made cold a precipitate occurs when the spirit is added; but if time be allowed, say two or three days, this precipitate is again dissolved.

Dr. SYMES said that Dr. Thresh was working towards the attainment of a very desirable object, namely, the production of a satisfactory sal volatile without distillation. One difficulty which he seemed to point to was that after admixture the preparation sometimes became coloured, and it would not do for chemists to trust a formula which was liable to give such a result. Dr. Thresh also found that the aroma of distilled sal volatile was more mellow than that of the product formed by simple admixture. He thought that the object sought had scarcely yet been attained in the best possible manner, but perhaps the author's object was to direct the attention of workers to this subject early in the day, that he might get their assistance. The work now required was, perhaps, to ascertain what results were produced by distillation, and whether the colour in the undistilled product was due, as Mr. Schacht suggested, to some oxidized matter in the essential oils, which matter might be separated by distillation. At the same time, he did not think that anybody could deny the value of the results so far as they went.

Mr. INCE thought that distillation could not be given up altogether in the preparation of sal volatile, and that it must be retained at least half way. It would be necessary to investigate whether there were not certain oils which could be used by simple admixture, and whether there were not others which could not be so treated. It was well known to pharmacists that there were certain oils which it would be useless and deleterious to attempt to distil. This was the case with heavy essential oils, by which he meant heavy oils having a very permanent and persistent odour, and it was a sort of law in pharmaceutical work that such an oil should be presented mixed with spirit, and this could always be done in the cold. In the case of such oils it would be best to use a simple admixture. The best way to use oil of peppermint was simply to make a mixture in spirit. It formed a very bad pharmaceutical preparation if distillation was used. The same was the case with oil of rosemary. If oil of lavender, which was a very heavy oil with a persistent odour, were distilled with spirit, the preparation was nearly worthless. He thought that at present there was no better formula before the public than that of the Pharmacopœia. In the case of a very light oil, like the essence of lemon, they would fail altogether if they simply resorted to mixture with spirit. The new preparation recommended itself in many ways, and particularly by the convenience of the process; but convenience must not be made a motive for departing from the instructions of the Pharmacopœia.

Mr. GILES said that the paper had two distinct aspects —one scientific, and the other practical. The characteristic feature of the practical aspect had not been spoken of. It was that it put into the hands of every pharmacist an easy means by which he might himself prepare sal volatile, and that was one of the most important considerations for a pharmacist. Many years ago he (Mr. Giles) attempted to make sal volatile. He thoughtlessly mixed the ingredients, *secundum* the Pharmacopœia, but not *secundum artem*, in a copper still. The meeting might imagine what a beautiful green he got. He corrected his mistake and then blundered into some of the results at which Dr. Thresh had arrived scientifically. He calculated out the results which the Pharmacopœia ingredients ought to produce and he dissolved these calculated products in the due proportion of water, but he found, for some reason which Dr. Thresh had now explained, that they would not remain dissolved when mixed with the spirituous solution of the aromatic oils. This difficulty was, however, removed by moderately heating the solution before mixing. Mr. Schacht seemed to think that heat was not necessary, but at all events it was convenient, and there was no objection to employing it. There was no magic in distillation, but there was a great deal of efficacy in heat. As Mr. Ince had said, there were two distinct processes with a distinct *rationale* for each. The *rationale* of the combination of the ingredients which went to form the ammoniacal constituents could be easily fulfilled by heating them in the aqueous solution to the required temperature. The perfection of the spirituous solution could be best obtained by distillation. But if the spirituous solution was treated separately it could be distilled in a copper vessel without any fear of contamination, and the anxiety arising from the fear of the fracture of a glass vessel could be avoided. If the process described was perfected and accepted there could be no excuse for any pharmacist not making his own spirit of sal volatile. He hoped that this subject would be prosecuted, and the next Pharmacopœia,—in which, of course, he anticipated, pharmacists would be concerned,—would contain a spiritus ammoniæ aromaticus which every one could make at home.

Mr. Ekin said that he believed that the discrepancies in the strength of sal volatile, to which Dr. Thresh had alluded, arose from a very simple cause. They might always get a uniform strength if there was sufficient condensing power. This was necessary whether they operated on a large quantity or a small quantity, and in summer or in winter.

Mr. Tanner, referring to Mr. Schacht's remark that time was necessary for the disappearance of the precipitate, said, as the result of the experimental trial which he had made, that neither three days nor three months would suffice to effect the combination of which Mr. Schacht spoke; but a temperature of 140° Fahrenheit would do it in a few minutes. The combination required was that of the ammonia with the official carbonate so as to be soluble in spirit. He had now in his possession some of the preparation which might have been made six months ago, and as nearly as he could judge the deposit was still the same as it was at first. Elevation of temperature was absolutely necessary to effect combination. If distillation be necessary all risk arising from the use of easily fractured glass veesels might be avoided by the use of a common tin bottle. Both the ammonia and the aromatic ingredients might be put into this vessel, and the distillation would be entirely free from metallic contamination. A one gallon or two gallon tin bottle, purchased at an oil shop and fitted with a cork and tube, would answer the purpose. He thought that it had been settled in that room, long ago, that the distillation of oil of lemons was not an improvement, and that the expressed oil was decidedly superior in flavour to any distilled product. In this respect he differed from Dr. Thresh. He failed to see the necessity for distillation at all, provided that the essential oils were fresh and pure.

Mr. Schacht said that it was very likely that Mr. Tanner and he were speaking of different things. Probably a mixture of ammonia in exactly the proportions given in the Pharmacopœia might result as Mr. Tanner had stated. He (Mr. Schacht) was rather directing attention to the results as detailed by Dr. Thresh, and he wished to say once more that if the proportions recommended by Dr. Thresh were adopted, it was certain that in three days a clear solution would be obtained without the aid of heat.

Mr. Andrews said that his experience was that oil of lemons was much more fragrant when it was simply dissolved in spirit than when it was distilled.

Professor Attfield, on being asked by the President to reply on behalf of Dr. Thresh, said that it was with great hesitation that he did so. Indeed, he must leave Dr. Thresh to settle with Mr. Martindale the question of the solubility of carbonate of ammonia in ammoniacal water. He thought that it would be clear that the paper contained three leading points. Dr. Thresh recommended what had been happily called semi-distillation, and in this he would be glad to receive the support of such pharmacists as Mr. Ince and Mr. Giles. Secondly, Dr. Thresh recommended the use of warmth in combining the bicarbonate in "carbonate" of ammonia with ammonia; and here he was supported by the practical experience of Mr. Tanner and Mr. Giles. Thirdly, the author pointed out the fact that if they did not use warmth a deposition of ammoniacal salt would occur when the alcohol was added. And in this he was supported by two most practical men—Mr. Tanner and Mr. Martindale. He (Professor Attfield) was sure that Dr. Thresh would also thank Mr. Giles for pointing out the extremely practical value of such papers, and how that with light of this kind thrown on their work retail pharmacists could now make preparations like sal volatile far more conveniently than they could make them previously.

The President said it would be convenient to discuss the next two papers together. They were on—

An Apparatus for Continuous Extraction, and The Assay of Nux Vomica,

BY W. R. DUNSTAN AND F. W. SHORT.

The papers are printed on pp. 663 and 665, and gave rise to the following discussion:—

Dr. Symes asked whether the authors in constructing the apparatus for extraction had tried the method, which he suggested about two years ago, of making the tube from the vessel pass through the centre of the marc rather than outside it. A large amount of condensation took place in the outer tube of the apparatus before them; but when the tube through which the vapour passed was carried through the centre of the marc, that condensation could hardly occur; and a larger proportion of marc also could be contained in the vessel. He had found from experience that a shorter tube might be used if the upper part was packed with silver gauze. This seemed to act mechanically, presenting a large surface and a number of points for condensation.

Professor Bentley said that he had long been aware that the nux vomica seeds of commerce varied considerably in strength; and having been in the habit of taking extract of nux vomica as a tonic he had suffered serious personal inconvenience from the variation. He had since taken solution of strychnia in order to get a definite compound. Mr. Hodgkinson had told him many years ago that it was well known to makers that certain commercial specimens of nux vomica yielded more strychnia than others, and he sent him samples of five varieties from Bombay, Madras and Cochin. This matter had been referred to in Bentley and Trimen's 'Medicinal Plants," where it is also stated that the Bombay variety yielded the most strychnia; and he (Professor Bentley) had also called attention to it for some years in his lectures. Perhaps it would be found that the strength of the seed differed according to its degree of maturity.

Mr. Giles asked to what Mr. Dunstan attributed the fact that chloroform mixed with spirit acted better as a solvent than chloroform. Was it due to the mixture penetrating better than the chloroform alone? And could Mr. Dunstan explain why the addition of sulphuric acid did not cause the alcohol to separate from the mixture?

Mr. Tanner said that it appeared to him that when two liquids of different boiling points were used in the same apparatus the marc was subjected to the action first of the one having the lower boiling point, and then to that of the one which had the higher boiling point. He had some time ago used a similar apparatus to that now exhibited, but it was made of tin ware, as described in Dorvault's 'L'Officine,' under the name of "Extracteur à distillation continue." He found that it answered well when a homogeneous liquid was used. With regard to Professor Dragendorff's process, he should like to ask whether sulphuric acid was the best thing with which to extract nux vomica. It appeared to him that the acetate of strychnia being much more soluble than the sulphate, dilute acetic acid would be preferable to dilute sulphuric acid. In the extraction of the chloroform particularly he should suggest the use of acetic rather than of sulphuric acid.

Professor Attfield said that there could be no doubt that a great many apparatus had been suggested which had some resemblance to the present one, but the point of novelty in the apparatus which was now exhibited was that one could carry on either infusion or distillation or percolation with it, and no apparatus had been previously made in which that could be done.

Mr. Gerrard said that the apparatus before them was very ingenious and simple, and in that respect it recommended itself; but there appeared to be an objection to it in the long continued application of heat to the matters exhausted by the solvents. They would never think of

estimating the amount of alkaloids in cinchona bark by such a process, for the long continued application of heat would interfere with the result. He should rather use hot percolation and evaporate at a low temperature. Temperature made a great deal of difference, especially in the case of alkaloids. He should like to ask to what extent alcohol was extracted by the water from the mixture of chloroform, alcohol and alkaloid. Probably it was nearly all removed, and, therefore, the aqueous alcoholic solution retained a considerable quantity of the sulphate of strychnine; and it would be necessary to have recourse to distillation or evaporation to obtain the full yield.

Mr. DUNSTAN, in reply, said, with regard to Dr. Symes's remarks as to condensation in the outer tube, that of course condensation occurred at first, but by fairly rapid boiling it was possible to get a temperature sufficient to volatilize the whole of the solvent from this tube. He had used the apparatus which Dr. Symes mentioned, but had not found that it was so efficacious for extraction as the present one. As to the different varieties of nux vomica which existed in commerce, if Professor Bentley would hand the samples he spoke of to Mr. Short and himself, they would be glad to examine them. Mr. Giles had asked why chloroform and alcohol extracted more readily than chloroform alone. The reason probably was that the chloroform alone was incapable of thoroughly penetrating the seeds. Mr. Giles mentioned that when chloroform and alcohol were mixed and shaken with sulphuric acid probably the alcohol would separate. Where chloroform and alcohol were present in equal quantities there would be a considerable separation taking place. It was not easy to see why the alkaloid was not wholly extracted by the dilute acid in that case, but it was a fact that it was not. As to the different boiling points of the two liquids, the result which Mr. Tanner had described might occur when there was a large proportion of solvents of very different boiling points, but it had not occurred with the present mixture. With chloroform containing 25 per cent. of alcohol the whole of the alcohol was carried up by the chloroform. Mr. Gerrard had spoken of the effect of the continuous application of heat upon the alkaloids; but he (Mr. Dunstan), failed to see that the method which Mr. Gerrard proposed avoided this. It was proved that strychnia and brucia were not altered by the temperature of boiling chloroform or of a mixture of chloroform and alcohol; nor were they altered by boiling in dilute sulphuric acid, according to Dragendorff. Of course there might be certain alkaloids which were altered at this temperature, but strychnine and brucine were not.

Two papers were then read—

ON THE CONSTITUTION OF LIQUOR SODÆ CHLORATÆ

and

THE ACTION OF CHLORINE UPON SOLUTIONS OF SODIUM CARBONATE.

BY W. R. DUNSTAN AND F. RANSOM.

The papers are printed on pp. 667 and 668, and gave rise to the following discussion:—

Mr. WILLIAMS said that he wished to congratulate the authors upon the papers which they had produced. He had had a good deal of experience in the subject to which they alluded, and these papers had cleared up some difficulties which had existed in his mind for a long time.

Professor ATTFIELD said that he had carefully followed the work of the authors, and he gave it as his candid opinion that they had clearly established the point which they had set out to establish. They had satisfactorily made out that chlorine acting upon a solution of carbonate of sodium gave a solution not of hypochlorite of sodium, but of hypochlorous acid. It was quite another question whether the solution which medical men prescribed should be one of hypochlorous acid or one of hypochlorite of sodium. It would be for therapeutists to decide that.

The meeting was adjourned to March 7.

Pharmaceutical Society of Ireland.

MEETING OF THE COUNCIL.

The monthly meeting of the Council of this Society was held on Wednesday, February 7, in the College of Physicians, Kildare Street, Dublin, at three o'clock.

Dr. Charles Tichborne, President, in the chair.

The other members of the Council present were—Dr. Aquilla Smith, Vice-President, Messrs. Allen, Brunker, Dr. Collins, Messrs. Draper, Grindley, Hayes, Minchin, Dr. Montgomery, and Mr. Simpson.

The President stated that Mr. Brunker had written to him suggesting that the Council should seek an interview with the Chief Secretary relative to the amendment of Irish Pharmacy Act, as if an interview were not obtained before the meeting of Parliament there would be no chance of doing anything this year. He (the President) coincided in that opinion and directed Mr. Fennell to write asking for an interview. Mr. Fennell would now read the reply which had been received.

Mr. Fennell read a letter from the Chief Secretary, Mr. Trevelyan, dated January 27, acknowledging the receipt of a copy of the report of the Pharmacy Act Amendment Committee of the Society, and expressing his regret that it was not in his power to receive a deputation from the Council, as he should have to leave town shortly after the beginning of February. He should be glad to consider any further views the Council might wish to state, if they would forward them in writing; and he would take the earliest opportunity he could of receiving a deputation.

On the motion of Dr. Collins, seconded by the Vice-President, the letter was ordered to be entered on the minutes.

A letter was read from Dr. Kaye, Q.C., Clerk of the Privy Council, dated January 22, which stated that a communication having been received from the Lords of the Privy Council of England, stating that the question of the amendment of the Pharmacy Act, of 1868, was now under consideration, and that he was desired to request the Council to give replies to the following questions:—(1) Whether the provisions of the Sale of Poisons (Ireland) Act, 1870, so far as regards the sale of poisons to persons unknown to the seller, are generally observed in Ireland; and, if so, whether any inconvenience has been caused thereby. (2) Whether it is considered desirable that any alteration should be made in the existing law by the amendment of the Sale of Poisons (Ireland) Act, 1870, or the Pharmacy (Ireland) Act, 1875, and if so, in what respect?

The President: Does not our report convey all our views?

Mr. Brunker; I do not think it does. We should get some more information as to the inconvenience arising from the sales of poisons.

Mr. Brunker moved—

"That the letter from the Clerk of the Privy Council of Ireland be referred to the Pharmacy Act Amendment Committee, who shall draw up a reply to same and report it to this Council, and that in the meantime circulars be sent to all licentiates residing in Ireland, requesting them to give any information in their power as to irregular sales of poisons in country districts."

Mr. Grindley seconded the motion, which was unanimously agreed to.

On the motion of Mr. Draper, seconded by Mr. Grindley, Mr. Brunker was appointed Chairman of the Pharmacy Act Amendment Committee.

A letter was read from Dr. Edmund W. Davy, examiner in chemistry, stating that the two other examiners, Dr. Duffey and Mr. Evans, concurred with him in suggesting that one entire day should be allowed to him (Dr. Davy) for written and practical examinations in

chemistry, and that the other of the two examination days should be divided between Dr. Duffey and Mr. Evans.

Mr. Draper said the suggestion was a most reasonable one, and moved that it be adopted, and that Dr. Davy's letter be entered on the minutes.

Mr. Hayes seconded the motion, which was agreed to unanimously.

A letter was read from Dr. Moore, Registrar of the College of Physicians, conveying the permission of the College for the use of the Fellows' Room once a quarter for meetings of the Council.

Dr. Collins moved—

"That the thanks of the Council be conveyed to the President of the College of Physicians, and that the letter of Dr. Moore be entered on the minutes."

Mr. Brunker seconded the motion, which was unanimously carried.

A letter was received from Dr. Pollock requesting, on behalf of the Academy of Medicine in Ireland, permission to use the Council room in February and April for the exhibition of sanitary improvements to the members of the Academy. The improvements were to be shown under the direction of Mr. Maguire, of Dawson Street, to a meeting of a sub-section of the Academy on State Medicine.

The President said he took on himself to give the permission asked, because he felt sure that the Council would be glad to assist so important a body as the Academy of Medicine. The appliances had accordingly been put into the room. But he wished to call attention to the fact that the Academy of Medicine had also asked for the use of the room on a second day, namely, the 12th of April. He did not know whether that would clash with the examinations of the Society or not.

The Vice-President: We have no right to give the room without the leave of the College of Physicians.

The President: Dr. Pollock stated that he had applied to the College of Physicians and they referred them to us. Was Dr. Moore consulted in the matter?

Mr. Fennell: Yes, he spoke to us about it.

Dr. Montgomery: The Council ought to assist as much as possible the improvement of sanitary arrangements.

Mr. Brunker moved—

"That the Secretary of the Department of State Medicine of the Academy of Medicine be informed that the department can have our room on the 12th of April next, provided their arrangements do not clash with our examinations which will take place on the 5th and 6th of that month, and also provided the sanction of the College of Physicians is obtained."

Mr. Allen seconded the above, which was adopted unanimously.

A letter was read from Mr. A. Davison, chemist, of Kimberley Diamond Fields, South Africa, presenting two packets of original prescriptions to the Society.

On the motion of Mr. Allen, seconded by Mr. Grindley, a vote of thanks was passed to Mr. Davison.

The President moved—

"That a notice must be forwarded by the Registrar to all members of the Pharmaceutical Society a fortnight before the expiration of their subscription to the effect that the *Pharmaceutical Journal* will not be supplied after the date which closes their subscription. That the Registrar be directed to act strictly in conformity with this resolution, but that on receipt of the lapsed subscription within a reasonable time he may forward the back numbers as supplied."

Last year the Society lost money by the *Pharmaceutical Journal* being supplied to members who neglected to pay their subscriptions. According to the existing regulation they were bound to supply the Journal for six months; and if a man then dropped off they lost his six months' subscription to the Journal, because he never informed them that he was going to drop off. He simply did not pay his money. They did not want members of that kind; they were a great drag on the Society. One object of his motion was to put an end to this state of things. Another was to test whether the supply of the Journal was an inducement to members to subscribe. The practice which he recommended was in existence in connection with all subscription journals in London and elsewhere; immediately the subscription was up the supply of the journal was stopped. One member of the Council had said that he did not like his (the President's) arrangement, and that the very day the notice appeared upon the paper three gentlemen had said they were taken by surprise, and had paid up their subscriptions. That he considered an excellent argument in favour of his motion.

Mr. Draper seconded the motion.

Dr. Montgomery said he thought it was a pity that gentlemen desiring to belong to the Society were also obliged to take the Journal. He thought members should be at liberty to take the Journal or not, as they pleased. Of course, the question was a broad one; but it would be a great matter if the Council could see their way to making the Journal a separate thing. The subscriptions of those who did not take the Journal might be reduced.

Mr. Draper: You should bring that question before a general meeting of the Society.

A Member of the Council pointed out that the supply of the Journal was merely an act of grace, and that the subscription, in any case, could not be reduced.

The latter part of the resolution was modified, so as to declare that the lapsed subscription should be sent in within two months; and with that alteration it was put and carried unanimously.

A report of the Law Committee, which recommended amongst other things that a circular should be issued to members of the Society asking them were they willing to contribute to a prosecution fund, was adopted.

A report of a Committee on the new mode of marking suggested for the examiners, was brought up. It stated that the members who attended the Committee were the President, Messrs. Allen, Brunker and Montgomery, together with Dr. Duffey and Mr. Evans, examiners. They had discussed the proposed rule as to percentage, and recommended that the minimum for Pharmacy should be 45 per cent., and that for Chemistry, Materia Medica, and Botany 40 per cent., and that the candidate should make a total of not less than 55 per cent. It was suggested that the examiner in arts should be requested to make his marking in conformity with this arrangement. The examiners had suggested that the written and the practical examinations should be on separate days, and the Committee recommended that that suggestion be acquiesced in.

The report was adopted.

The Council then adjourned.

Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

The eighth general meeting of the above Association was held at the Royal Institution, on Thursday, February 1, 1883. The President, Mr. Joseph Woodcock, occupied the chair.

The minutes of the last meeting were read and confirmed.

The following donations were announced:—The *Pharmaceutical Journal*, from the Society; the *Canadian Pharmaceutical Journal*, from the Editor.

Mr. A. H. Samuel called attention to the recent discovery that some of the Paris Hospitals had been

supplied with a preparation under the name of quinine containing upwards of 40 per cent. of cinchonine.

Mr. Symes mentioned the subject of permanganate of potash pills.

Mr. T. Farmer, F.C.S., F.R.H.S., then read a paper upon the "Development of Theory in Chemistry."

A vote of thanks, proposed by Mr. A. H. Samuel, was passed to Mr. Farmer for his interesting and elaborate paper.

ABERDEEN CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

The weekly meeting of this Association, was held on Thursday, February 8. The President occupied the chair and there was a fair attendance.

The subject on the syllabus was a debate on "Should the Proposed Curriculum be adopted." It was opened in the affirmative by Mr. Charles Moir, and the negative was argued by Mr. R. Eden. The discussion was entered into with great spirit, being taken part in by nearly all present.

On the vote being taken at the close it was found that the negative view had commanded the majority of votes.

A vote of thanks to the leaders terminated the proceedings.

LEICESTER CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

The half-yearly meeting of the above Association was held at the rooms, Halford Street, on Thursday, February 1, 1883. The President, Mr. J. J. Edwards, in the chair.

After a few remarks from the President, a report of the past half-year's work was read and adopted, from which the following has been abridged:—

The Committee stated that the materia medica class had been continued, and a chemistry class again started, both attaining a fair amount of success. The number of members had increased; but it had been found absolutely necessary to resort to some practical means for the increase of the funds, and with this object in view, the fees of the members had been raised. This to some degree had had the desired effect, but as there had been shortcomings elsewhere, it had not entirely removed the difficulty. It is earnestly desired that the Association should receive the full support of the members of the trade, lest that which has been the means of untold usefulness in the past, and held a high place amongst associations of its kind, should come to an issue by no means pleasing. The hearty thanks of the Committee were tendered to the honorary members for their subscriptions; the Pharmaceutical Society, for the Journal; the British Pharmaceutical Conference, for the last 'Year-Book of Pharmacy'; and the gentlemen who had delivered lectures during the half-year.

The meeting then proceeded to the election of a Committee for the ensuing session, with the following result:—Mr. J. Garrett, President; Mr. J. J. Edwards, Vice-President; Mr. W. B. Clark, Treasurer; Mr. R. E. Broof, Secretary; Messrs. Kelly, E. Brice and Winter.

The balance sheet showed that the receipts during the half-year had amounted to £13 17*s.* 4*d.*, and that the balance due to the Treasurer had been reduced from £5 13*s.* to 15*s.* 9*d.*

EDINBURGH CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

The seventh meeting of this session was held in the Pharmaceutical Society's Rooms, 119A, George Street, on Wednesday, January 31, Mr. Peter Boa, President, in the chair.

The minutes of the former meeting having been read and confirmed, the Chairman called upon Mr. J. R. Hill, Secretary to the Association, to read a paper on "The Manufacture of Sulphuric Acid."

In the introductory portion of this paper the properties and uses of sulphuric acid were fully treated, it being pointed out that nearly nine-tenths of the product is utilized by the manufacturers in the production of alkali, artificial manures, etc. The history of the acid from the time of Geber up to the present time was then given, the author incidentally noting the different methods of preparation used from time to time and the quantities and market value of acid so produced. He then proceeded to consider the composition, properties and sources of the raw materials employed. Regarding sulphur, it was mentioned that at one time Sicilian sulphur was the only body employed for the production of sulphur acids, but owing to the monopoly granted by the Sicilian Government its use for this purpose had now been almost superseded by pyrites. A full account of the methods employed in manufacturing acid from both materials was given, the description being rendered very interesting by means of a series of diagrams of furnaces, Gay Lussac and Glover towers and other plant employed, as well as by an enlarged plan of a sulphuric acid manufactory. The paper concluded with a summary of the theories advanced regarding the reactions which may take place during the chamber and denitrating stages, the author illustrating his statements by blackboard equations.

A discussion followed the reading of the paper, in which Messrs. Adamson, Boa, Hendry and MacEwan took part.

On the motion of the President, a hearty vote of thanks was accorded to Mr. Hill for his interesting communication.

A series of specimens illustrative of the paper will be shown at the next meeting of the Association.

After some other business had been disposed of, the President announced the next meeting for February 21, when a paper on "The Manufacture of Alcohol" will be read by Mr. James McGlashan.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

A meeting of this Society was held on February 1. Dr. Gilbert, President, in the chair.

The minutes of the previous meeting were read and confirmed.

The following certificates were read for the first time: G. Board, J. J. Knight, J. O'Sullivan, A. Vasey, T. D. Watson, R. M. Walmsley.

During the evening a ballot was held, and the following were declared by the Scrutators, Messrs. J. Spiller and W. Thorp, to be duly elected, as Foreign Members: F. Beilstein, D. T. Cléve, H. Debray, E. Erlenmeyer, R. Fittig, H. Helmholtz, D. Mendelieff, Victor Meyer, Lothar Meyer; as ordinary Fellows, H. C. Bond, G. Chandra Basu, J. Brock, A. M. Chance, J. T. Donald, H. C. Foote, W. Fox, W. R. Flett, J. A. M. Fallon, E. C. Gill, F. Gothard, J. Hunter, H. Jones, R. B. Lee, A. H. Jackson, Joowansinghi, T. Jenner, J. E. Johnson, W. W. J. Nicol, F. W. Richardson, E. S. Spencer, C. A. Serré, T. Turner, J. E. Tuit.

Dr. Hodgkinson then communicated to the Society a paper—

On Derivatives of Fluorene. By W. R. E. Hodgkinson and T. E. Matthews.—Since Berthelot first isolated diphenylenmethane from coal tar oil, this body, termed fluorene from its supposed fluorescent properties, has been studied by several chemists. The object of the present investigation was to obtain a hydroxyl derivative. The fluorene was obtained in a state of approximate purity from Schuchardt and Kahlbaum. It was crystallized five

or six times from hot alcohol, those crystals only being reserved which fell out between 25°–30°, and thus a pure product melting constantly at 113° and boiling 298°–305° was obtained. The slight fluorescence of this pure product can be entirely removed by sublimation over a little potassium carbonate. A dibromfluorene $C_{13}H_8Br_2$ and a monobromfluorene $C_{13}H_9Br$ were obtained; both these bodies yield on oxidation a substituted diphenylen ketone. The authors have also prepared fluorene sulphonic acid, $C_{13}H_9SO_3H$, by treating a chloroform solution of fluorene with SO_3HCl; the potassium, barium and cadmium salts were prepared and analysed. On heating the potassium sulphonate with potash to 400° C, acidifying the product and distilling in a current of steam, a white crystalline substance came over consisting of a substance melting at 205°, having the composition $C_{12}H_{10}O_3$, and a second substance much more soluble in water. This extraordinary result, the formation of trihydroxydiphenyl, can only be brought about by the splitting off of the methylen group in fluorene, and its replacement by two hydroxyl groups. By dropping the hydrocarbon into fused potash a dihydroxydiphenyl $C_{12}H_{10}O_2$, melting at 98°, was prepared. The authors shortly discuss the constitution of these bodies. The authors have also prepared dichlorfluorene $C_{13}H_8Cl_2$ by passing chlorine through a cold chloroform solution of fluorene. By using boiling chloroform a substance $C_{13}H_5Cl_7$ is obtained; a completely different action takes place when chlorine is passed into boiling fluorene. Fused potash acts energetically on these chloro-derivatives.

Mr. R. Cowper then read a paper—

On the Action of Chlorine on certain Metals.—As previously noticed by Wanklyn, dry chlorine is quite unable to act upon metallic sodium. The author finds that chlorine which has been perfectly dried by long contact with fused calcium chloride is without action on Dutch metal foil; on introducing a minute quantity of water the ordinary reaction ensues immediately. Similarly zinc foil and magnesium are not attacked. Silver and bismuth are tarnished very slowly. Tin foil, arsenic, and antimony are attacked immediately. The author remarks that these three metals all form chlorides which are liquid at ordinary temperatures. Chlorine, whether dry or moist, attacks mercury. If dried chlorine be passed over a piece of potassium the latter catches fire; this is probably caused by the envelope of hydrate. Potassium was sealed up in a tube containing dry air; the tube was then heated until all the oxygen was absorbed and a bright surface of potassium obtained; the tube was then filled with chlorine. The surface of the metal became slowly covered with a deep purple film, and the potassium finally ignited when heated considerably above its melting point.

Dr. Armstrong suggested that the author should dry the chlorine with phosphoric anhydride, and then try its action upon antimony; it was most important to settle the question whether two bodies could act upon each other without the presence of a third. Thus in most textbooks it was stated that zinc dissolved in sulphuric acid; now, zinc is quite insoluble in sulphuric acid, and the presence of water is necessary to effect solution.

Mr. J. Spiller asked if the author had ascertained, in an alloy, whether chlorine attacked one metal leaving the other untouched, as, for instance, an alloy of zinc and tin.

Mr. Groves said that bromine when dry had no action upon zinc, but acted violently upon antimony and tin.

Dr. Hodgkinson mentioned that sulphur dioxide and sulphuretted hydrogen did not act upon each other if perfectly dry.

Professor McLeod said that similarly carbonic oxide and oxygen did not explode if free from moisture.

Mr. Cowper in reply said that he had not tried the action of chlorine upon an alloy of zinc and tin, nor upon phosphorus.

Mr. L. T. Wright then read a paper entitled—

Some Notes on Hydrated Ferric Oxide and its Behaviour with Sulphuretted Hydrogen.—The author endeavoured to prepare hydrated ferric oxide by precipitating the chloride with ammonia, but could not succeed in preparing it free from basic chloride. In order to avoid the inconvenience of handling a bulky gelatinous precipitate the following method was tried:—Ferric chloride solution was added slowly to an excess of ammonia, and the whole evaporated to dryness at 100°. The reddish brown mass on treatment with water fell into an impalpable powder, which, for the most part, passed through many filter papers. The filtrates were turbid and of a bright red colour. In this condition the precipitate is probably similar to the so-called "colloidal ferric hydrate." The ferric hydrate in this condition is not blackened by sulphuretted hydrogen. Recently precipitated ferric hydrate is blackened at once by sulphuretted hydrogen, and the sulphide thus formed is completely soluble in excess of potassic cyanide

$$FeS + 6KCN = K_2S + K_4Fe(CN)_6.$$

Two equations are given in text-books to express the reaction of sulphuretted hydrogen upon hydrated ferric oxide,

(1) $Fe_2O_3H_2O + 3H_2S = Fe_2S_3 + 4H_2O$

(2) $Fe_2O_3H_2O + 3H_2S = 2FeS + S + 4H_2O$.

The author has studied the reaction, estimating the sulphur and the water formed.

Mr. Page suggested that it would be interesting to know whether the finely divided precipitate could be filtered off by sucking the fluid by a Sprengel pump through porous porcelain. Milk when thus filtered through the porous cell of a Daniell battery furnishes a perfectly transparent filtrate almost free from albuminous bodies and fats, but containing the sugar and salts.

The Secretary then read a paper—

On Alpha Cyano-naphthalene Sulphonic Acid. By U. K. Dutt.—The author first prepares naphthalene alpha sulphonic acid by treating naphthalene in carbon disulphide solution with sulphuric hydrochloride. The acid was converted into a potassium salt, which was distilled with an equal quantity of potassium ferrocyanide. The product was crystallized from light petroleum, and obtained as yellowish acicular crystals, melting at 36°. This α-cyano-naphthalene was dissolved in carbon disulphide and treated with sulphuric hydrochloride, and thus brilliant, colourless, laminar crystals of α-cyano-sulphonic acid were obtained; the barium salt was also prepared and analysed by the author.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

W. W. Morris.—(1) *Hypnum alopecurum.* (2) *Trichocolea tomentella* (scale moss). (3) *Plagiochila asplenioides* (scale moss). (4) *Hypnum cuspidatum.* (5) *Mnium hornum.* (6) *Hypnum triquetrum.*

M.P.S.—Syrup of white poppies.

An Assistant.—We do not think the subject can be discussed profitably in these columns, by persons unacquainted with all the circumstances of the case. Evidently there is some excuse for irritation.

R. B. Rees.—A recipe for ginger ale will be found in vol. xi., p. 588. As to "soluble essence of ginger," see Mr. Thresh's papers, vol. x., pp. 193 and 260.

Nemo.—A widow of a chemist and druggist, left sole executrix, may carry on the business with the aid of a qualified assistant, only during the time in which she is engaged in carrying out the duty of executrix.

Communications, Letters, etc., have been received from Dr. Symes, Dr. Hesse, Messrs. Benjamin, Long, Martin, Symons, Smith, Forrest, Haydon, Wade, Laurie, Vincent, Evans, Pond, Williams, Hoult, Clagur, Cymro, Tinct. Gent. Co., A Forth Bank Assistant, One who Loves the Work, etc., B. J.

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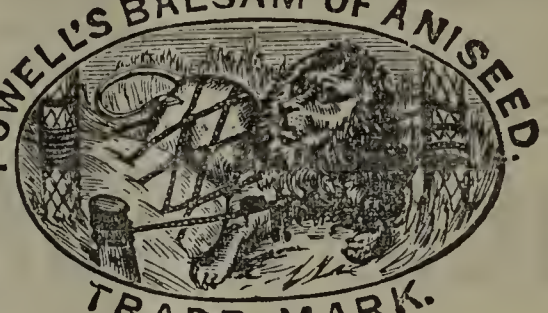

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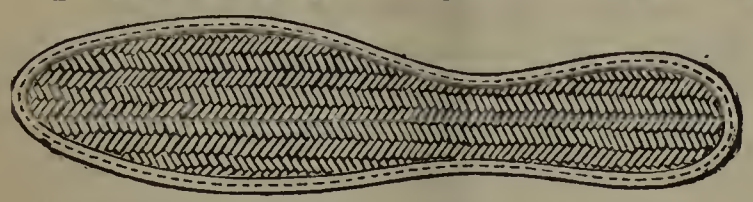

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The Pharmaceutical Journal AND Transactions.

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For particulars respecting the Fund, see p. 689.

EVENING MEETING.

The next EVENING MEETING will be held on Wednesday, March 7th, 1883, at Eight o'clock.

The Chair will be taken at half-past Eight *precisely*.

Papers intended to be read at that Meeting should be forwarded to the Secretary not later than Wednesday, February 28th, as papers received after that date cannot be announced in the *Pharmaceutical Journal* previous to the Meeting.

PRELIMINARY EXAMINATION.

This Examination will be held throughout Great Britain, at 12 o'clock at noon, on the first **Tuesdays** in January, April, July, and October. Candidates must give notice to the Registrar on a printed form of application, to be obtained from him, and pay the Fee, not less than *fourteen* days prior to that on which the examination is to be held.

INDEX TO THE PHARMACEUTICAL JOURNAL FROM JULY, 1868, TO JUNE, 1878.

An Index of the ten Volumes of the *Pharmaceutical Journal*, from July, 1868, to June, 1878, has been compiled and printed, price 2*s.* 6*d.*, or by post, 2*s.* 8½*d.* Each Member and Associate of the Society will be supplied with one copy *gratis*, on application to the Secretary.

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CALENDAR OF THE PHARMACEUTICAL SOCIETY FOR 1883.

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OF THE

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FORTY-FIRST SESSION, 1882-83.

CHEMISTRY AND PHARMACY. ....Professor REDWOOD.
On Monday, Tuesday, and Wednesday Mornings, at 9 o'clock.
BOTANY AND MATERIA MEDICA .....Professor BENTLEY.
On Thursday, Friday, and Saturday Mornings, at 9 o'clock.
PRACTICAL CHEMISTRY ....Professor ATTFIELD.
Daily at 10 o'clock, in the Laboratory.

RE-COMMENCEMENT OF LECTURE COURSES.

The course of Lectures on "Chemistry and Pharmacy" will re-commence on Monday Morning, March 5th, at 9 o'clock, and on "Botany and Materia Medica" on Thursday, March 1st, when Professor Bentley will give his first lecture on Botany. The Course on Materia Medica and Botany will include the Lectures on Systematic and Practical Botany, which will be delivered in the Gardens of the Royal Botanic Society, Regent's Park.

THE LECTURES ON CHEMISTRY AND PHARMACY

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2. The chemistry of inorganic bodies, including a description of the elements and their more important inorganic compounds, especially those used in medicine.

3. The chemistry of organic compounds, with a description of such as have important applications in the arts and in medicine.

The subjects will be fully illustrated with experiments, diagrams and specimens, and every lecture will be followed by an examination of the class on those subjects which have been previously treated of by the Professor.

With the view of connecting the lecture teaching with the instruction given to the practical class in the laboratory, and of enabling the Professor to increase the number of his experimental illustrations, the Demonstrator of Practical Chemistry will assist at these lectures and at the examinations.

Instruction in Practical Dispensing will be provided for those Students who have previously had but slight means afforded them of becoming skilled in such operations.

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2. Organic Materia Medica, comprising the medicinal substances obtained from the organic kingdom, which are considered in the order of the natural historical relations of the organized beings which produce them.

3. Systematic and Practical Botany, which is taught during the summer months in the Royal Botanic Society's Gardens, Regent's Park.

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In order to test the proficiency of the pupils, and to bring them into more intimate intercourse with the Professors, a *vivâ voce* examination is held after each Lecture. It is hoped that all pupils will attend these examinations.

INSTRUCTION IN PRACTICAL CHEMISTRY

Is conducted in the Laboratory by the Professor and Demonstrator. The Laboratories are open from ten o'clock in the morning until five in the afternoon daily, except on Saturdays, when they are closed at two o'clock. They are fitted up with every convenience for the study of the principles of Chemistry by personal experiment. They are specially designed for the student of Pharmacy, but are equally well adapted for the acquirement of a knowledge of Chemistry in its application to Medicine, Manufactures, Analysis, or Original Research. There is no general class for simultaneous instruction, each Student following an independent course of study always determined by his previous knowledge; pupils can therefore *enter for any period at any date.* A Junior course occupies about 5 months. A complete course of instruction, including the higher branches of Quantitative Analysis, occupies ten full months, and dated from the day of entry to that day twelvemonth.

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Application for Admission to the School, for Prospectuses, or for further information, may be made to the Professors or their Assistants in the Lecture Room, or Laboratories, 17, Bloomsbury Square, London, W.C.

Concordia ſoll ihr Name ſeyn.

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This Association of Chemists and Druggists and others interested in Pharmacy is managed by about twenty unpaid officers annually elected by the members.

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The chief business of the meetings is the communication of written descriptions of original investigations made by members during the year, and includes discussions on such papers by the assembled members and visitors.

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THE YEAR-BOOK OF PHARMACY AND TRANSACTIONS.

The Conference annually presents to members a handsome octavo volume of about 500 pages, containing the proceedings at the yearly meeting, and a report on the progress of pharmacy, or Year-Book, comprising abstracts of papers on pharmacy, materia medica, and chemistry, and on new preparations, processes, and formulæ, published at home and abroad during each year. The funds of the Conference, derived from annual subscriptions of seven shillings and sixpence, are devoted to the production of this useful book, no pains being spared to make it the desk companion of the year, and an invaluable permanent work of reference for every chemist and druggist. The Executive Committee of the Conference trusts that members will show the current Year-Book to their friends and acquaintances—principals, assistants, or pupils—and obtain as large a number of new members as possible. Alphabetical lists of the names and addresses of subscribers will be found in each Year-Book.

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Remittances may be made by Post Office Order, *crossed* "& Co.," made payable to the *British Pharmaceutical Conference*, at the "High Holborn" Post Office, and should be addressed as follows :—*The Secretary, Brit. Pharm. Conf., 17, Bloomsbury Square, London, W.C.*

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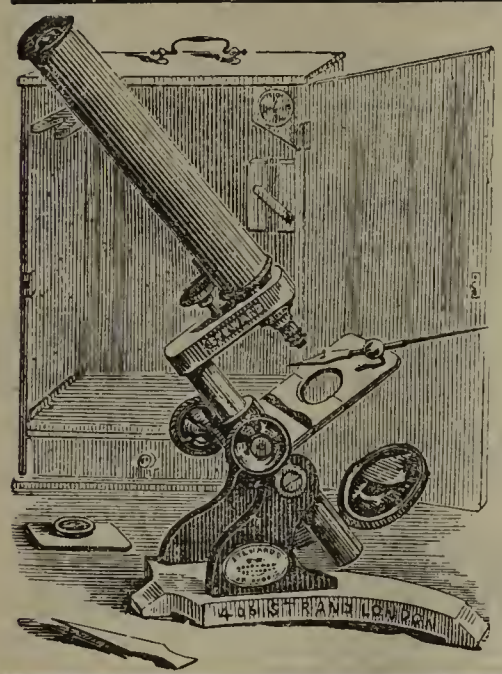

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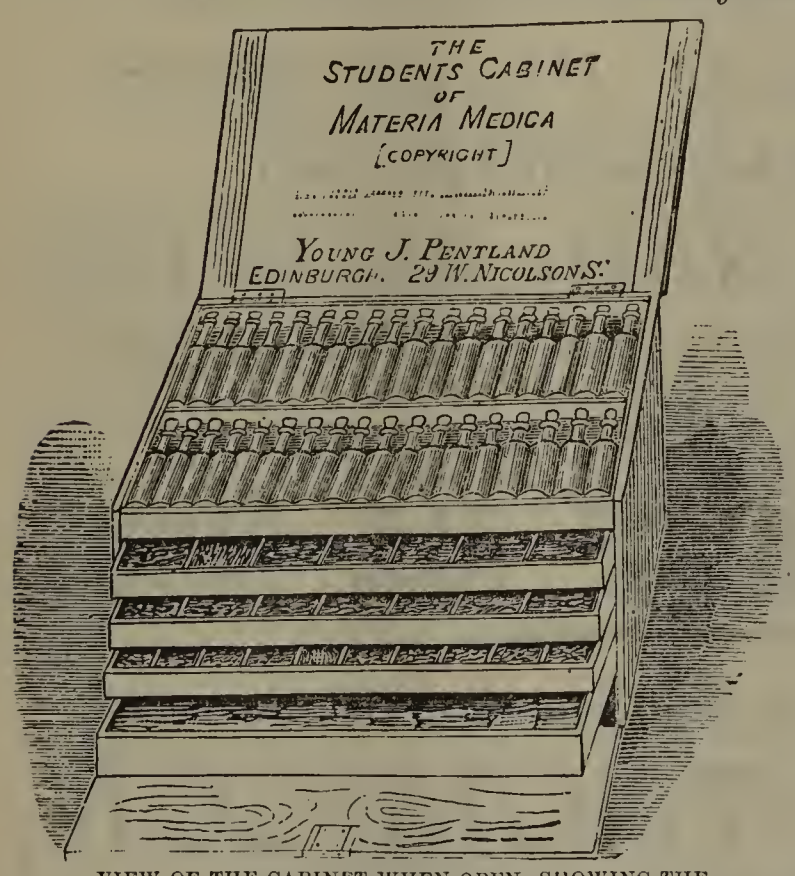

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(BICHLORIDE),
Discovered to be a general Anæsthetic by Dr. RICHARDSON, in 1867.
1 lb. Bottles, 16s.; 8 oz., 8s. 6d.; 4 oz., 4s. 6d.; 2 oz., 2s. 6d.

COMPOUND ANÆSTHETIC ETHER,
For producing Local Anæsthesia.
In 4 oz., 10 oz., and 20 oz. Stoppered Bottles, 2s., 4s., and 7s.

OZONIC ETHER,
In 4 oz. and 16 oz. Stoppered Bottles, 3s. 6d. and 12s.

PEROXIDE of HYDROGEN,
First introduced as a Medicine by Dr. RICHARDSON.

ETHYLATE of SODIUM
(Dr. RICHARDSON'S Formula), for removing Nævi, &c. In ½ oz. and 1 oz. Bottles, with elongated stoppers for applying the caustic, 2s. 6d. and 4s.

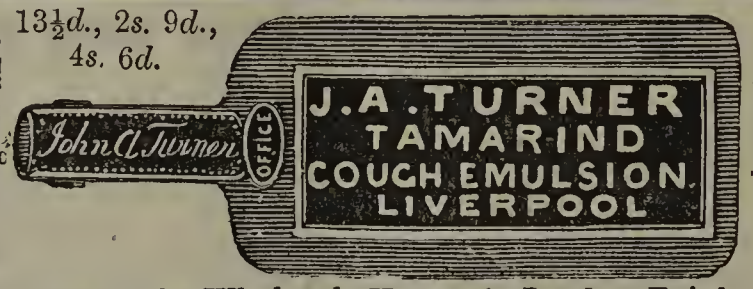
STYPTIC COLLOID,
For promoting the Healing of Wounds by the first intention.
In 2 oz. and 4 oz. Bottles, with Brush, 2s. 6d. and 4s. 6d.; 16 oz., 12s.

CHARCOAL CAPSULES,
Containing pure Vegetable Ivory Charcoal. In boxes, 2s. 6d. each.

J. ROBBINS & Co. 147 OXFORD ST.

An elegant and

13½*d.*, 2*s.* 9*d.*, 4*s.* 6*d.*



pleasant Preparation,

Sold by all the Wholesale Houses in London, Edinburgh, Liverpool, Manchester, York, Leeds, Thirsk, and by respectable Pharmacists and Chemists.

*** For Bills and Tablets apply to J. A. T., Pharmacist, Liverpool.

BRECKNELL'S SKIN SOAP

IS THE BEST AND MOST SALUBRIOUS SOAP IN USE.

BRECKNELL'S SADDLE SOAP,

Used in the Royal Stables, by the Army, and in Hunting Establishments.

The BEST ARTICLE for the PURPOSE.

BRECKNELL, TURNER & SONS,

HAYMARKET, LONDON.

SILVER MEDAL, PARIS, 1878.

JUJUBES

A. & H.

TRADE MARK,

A.D. 1715.

Prepared by Patent Process.

	1-lb. size.	1/- size.	6d. size.
	Per doz.	Per doz.	Per doz.
ANISEED LIQUORICE....	30/-	8/-	4/-
BLACK CURRANT	,,	,,	,,
DELECTABLE.....	,,	,,	,,
EXTRACT OF MALT	,,	,,	,,
GLYCERINE.....	,,	,,	,,
LICHEN	,,	,,	,,
LIQUORICE	,,	,,	,,
MAGNUM BONUM	,,	,,	,,
PECTORALE	,,	,,	,,
PINE (Pâte de Jujube)	,,	,,	,,
RASPBERRY	,,	,,	,,
ROSE	,,	,,	,,
TAMARIND	,,	,,	,,
VIOLET	,,	,,	,,
VOICE	,,	,,	,,
GUIMAUVE CUBES or PASTILLES	42/-	8/-	

JUJUBES 2/- per lb. or in tin boxes.

2/6 per lb.

GUIMAUVE SHEETS .... **2/-** ,,

One Pound Guimauve Tins are returnable at 12/- per dozen.

	1-lb. size.	1/- size.	6d. size.
	Per doz.	Per doz.	Per doz.
	32/-	8/6	4/4
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PASTILLES 2/2 per lb. or in tin boxes.

All the above tins are neatly wrapped ready for sale. The One Pound Tins are returnable at 6/- per dozen

CRYSTALLIZED FRUIT PASTILLES, 1/6 per lb., separate or mixed fruits.
A 7lb. Box do. do. 10/6
CRYSTALLIZED ROSE, PINE and VIOLET JUJUBES, Diamond shaped, separate or mixed, 1/4 per lb.

SPECIAL NOTICE.—*Jujubes and Pastilles can always be made any special flavour, colour, or shape, if a quantity of not less than 56lbs. be ordered at a time. Quotations given.*

PECTORAL FRUIT PASTILLES.

(REGISTERED.)

A bronchial and pulmonic Jujube of delicious flavour.

Sold only in round boxes to retail at 1/-, 1/9, and 3/- each; 9/-, 16/-, and 27/- per doz.

SUPERIOR UPRIGHT SHOW CASES.

Frames fitted with glass shelves, silvered glass backs, and lettered in gold; with three glass dishes to display thre kinds of Jujubes or Pastilles. Price 42/- each. Size, 21 in. high, 10 in. broad, and 8 in. deep. New and handsome Show Cards and Handbills on application.

MEDICATED THROAT PASTILLES.

1.—**Morphia.** ($\frac{1}{40}$ of a grain.)
Adult dose: 6 to 10 daily.

2.—**Ipecacuanha.** Are readily taken by children. These pastilles are of the same strength as the B.P. lozenges.

3.—**Morphia and Ipecacuanha.** ($\frac{1}{40}$ grain Morph., and $\frac{1}{4}$ grain Ipecac.)
Adults may take 1 every two, three, or four hours.

4.—**Compound Morphia and Ipecacuanha.** A more aetive remedy than No. 3. ($\frac{1}{40}$ grain Morph., $\frac{1}{5}$ Ipeeae., $\frac{1}{5}$ Squill, &c.)
For adults, 1 every two, three, or our hours.

5.—**Opium and Belladonna.** An agreeable substitute for the Troch: Opii B. P., and of the same strength.

6.—**Aconite.** Eaeh Pastille equivalent to half a drop of the B. P. Tineture.
Adult dose: 1 every two, three, or four hours.

7.—**Compound Camphor or Voice.**
Adult dose: from 3 to 6 or 8 at intervals during the day.

8.—**Chlorate of Soda.** May be taken whenever the throat is uneasy.

9.—**Lithia.** An agreeable mode of taking this alkali. Each pastille eontains 1 grain.
Dose: from 5 to 10 daily.

10.—**Benzoated Voice.** Useful to public speakers, &c. Less active than the Compound Camphor, No. 7.

11.—**Chlorate of Potash.** A more agreeable form than the lozenge of the Pharmacopœia.
Dose: 6 to 12 daily.

12.—**Chalybeate.** (Pastilli Ferri., A. & H., 1 grain Citrate of Iron.) An agreeable form of lozenge, readily taken by ehildren.
Dose: 3 to 12 daily, aeeording to age of patients.

13.—**Rhatany.** Astringent.
Dose: 6 to 12, daily, at intervals.

14.—**Tannin.** Astringent, and of the same strength as the Troch: Aeid: Tannic: P.B., and they may be taken to the same extent as No. 13.

15.—**Carbolic Acid.** ($\frac{1}{2}$ a grain in eaeh.)

16.—**Bromide of Ammonia.** (1 grain in each.)

17.—**Chlorate of Potash and Borax.** (1 grain of eaeh.)

18.—**Borax.** (2 grains in each.)

19.—**Chloride of Ammonium.**

These Pastilles are supplied in 1-lb. Bottles at 36/- per dozen, the Bottles returnable at 6/- per dozen; and in Boxes containing three ounces, to retail at 1/- each, 8/- per dozen.

CIRCULARS FOR DISTRIBUTION AMONGST MEDICAL MEN SUPPLIED ON APPLICATION.

MANUFACTURED BY

ALLEN & HANBURYS, Plough Court, Lombard St. London.

DR. J. COLLIS BROWNE'S
CHLORODYNE
THE ORIGINAL AND ONLY GENUINE.

IMPORTANT CAUTIONS

From Lord Chancellor SELBORNE, Vice-Chancellor Sir W. PAGE WOOD, and the LORDS JUSTICES of APPEAL.

VICE-CHANCELLOR SIR W. PAGE WOOD, by whom the suit in Chancery was first heard, stated, in his judgment, that "Dr. J. Collis Browne was undoubtedly the Inventor of Chlorodyne, that the whole story of the Defendant Freeman was as deliberately untrue as the falsehood he had deposed to with reference to the use of his Chlorodyne in the Hospital."

THE VICE-CHANCELLOR also stated, "that Chlorodyne was a fanciful name, and had application been made sooner, the Court would have given Dr. Browne protection."

LORD CHANCELLOR SELBORNE coincided with the judgment of the Vice-Chancellor upon this point, and stated "that had application been made at a proper time and place, the Court would have found means to restrain the Defendant from misrepresenting the decision of the Vice-Chancellor."

LORD JUSTICE JAMES on appeal stated, in his judgment, "that the Defendant Freeman had made a deliberate misrepresentation of the decision of Vice-Chancellor Wood."

It was proved in Court, on affidavit by Mrs. Forbes, of Paris, that the testimonial published in the *Times*, November 14th, 1865, speaking of the great efficacy of Chlorodyne in Cholera referred to Dr. J. Collis Browne's Chlorodyne, and that she never used any other, that she had written to the Defendant Freeman to that effect, notwithstanding which notice the Defendant publishes the said testimonial as referring to his medicine.

The Editor of the *Medical Times*, in his report on Chlorodyne, January 13th, 1866, gives information that the Chlorodyne referred to was the medicine introduced by a retired Army Medical Officer, which was Dr J. Collis Browne, still this is published by the Defendant as testimony to his medicine.

Numerous affidavits from eminent Physicians and others were produced in Court, stating that Dr. J. Collis Browne was the inventor of Chlorodyne, and that when prescribing they mean no other.

The Defendant himself publishes that his compound is in effect and composition quite different to any other preparation, nevertheless he assumes the name, testimonials, &c., of Chlorodyne.

Technicalities in law prevent that protection which the public should justly have against such a course of conduct. It is now incumbent on all who purchase Chlorodyne to see that the name, "Dr. J. Collis Browne's Chlorodyne," is engraved on the Government Stamp, as it is not sold otherwise. All other compounds under the name of Chlorodyne are spurious. All attempts at analysis have failed, hence the statement that the constituents of Chlorodyne are known is a misrepresentation.

FURTHER IMPORTANT NOTICE.

From SYMES & Co., Pharmaceutical Chemists, Medical Hall, Simla.—*January* 5, 1880.

To J. T. DAVENPORT, Esq., 33, Great Russell Street, Bloomsbury, London.

DEAR SIR,—Have the goodness to furnish us with your best quotations for Dr. J. COLLIS BROWNE'S Chlorodyne, as, being large buyers, we would much prefer doing business with you direct than through the wholesale houses. We embrace this opportunity of congratulating you upon the wide-spread reputation this justly-esteemed medicine has earned for itself, not only in Hindostan, but all over the East. As a remedy of general utility we much question whether a better is imported into the country, and we shall be glad to hear of its finding a place in every Anglo-Indian home. The other brands, we are happy to say, are now relegated to the native bazaars, and, judging from their sale, we fancy their sojourn there will be but evanescent. We could multiply instances, *ad infinitum*, of the extraordinary efficacy of Dr. COLLIS BROWNE'S Chlorodyne in Diarrhœa and Dysentery, Spasms, Cramp, Neuralgia, the Vomiting of Pregnancy, and as a general sedative, that have occurred under our personal observation during many years. In Choleraic Diarrhœa, and even in the more terrible forms of Cholera itself, we have witnessed its surprisingly controlling power. We have never used any other form of this medicine than COLLIS BROWNE'S, from a firm conviction that it is decidedly the best, and also from a sense of duty we owe to the profession and the public, as we are of opinion that the substitution of any other than COLLIS BROWNE'S is a deliberate breach of faith on the part of the chemist, to prescriber and patient alike.

We are, Sir, faithfully yours,
SYMES & CO.,
Members of the Pharmaceutical Society of Great Britain,
His Excellency the Viceroy's Chemists.

After these public statements in a Court of Equity, and subsequent confirmation by the trade at large, no Chemist can conscientiously use or sell any other compound for Chlorodyne, without committing a breach of faith unjust to patient and physician. The value of the remedy *alone* creates the great demand.

Sold in Bottles—1*s.* 1½*d.*, 2*s.* 9*d.*, 4*s.* 6*d.*, and 11*s.* Usual Discount to the Profession.

SOLE MANUFACTURER,

J. T. DAVENPORT, Pharmaceutist,

33, GREAT RUSSELL STREET, BLOOMSBURY SQUARE, LONDON.

COX'S TASTELESS PILLS

BY ROYAL LETTERS PATENT,

Dated and Sealed April 13th, 1854.

Surgeons and Chemists supplied with an excellent Aperient Pill (the formula for which will be forwarded), covered with a thin non-metallic film, rendering each Pill perfectly tasteless, at 1*s.* a gross. Postage free.

Any formulæ dispensed and covered, and samples, with list of pills, from 500 different forms, which are kept in stock, will be forwarded free on application.

They were introduced to the medical profession by the present proprietors a quarter of a century ago, and many thousands of unsolicited testimonials have been received from the highest medical authorities. These Pills are now used, and have been used for many years past, by the largest and best conducted hospitals and dispensaries. Of course, a success like this has led to many imitations, and highly-varnished pills, made to resemble ours, have been introduced by some unscrupulous people. Many of these pills pass through the stomach unaltered, and a useful invention is thus likely to be brought into disrepute.

The most impudent assertions are made by some of these people, who combine, in one incongruous whole, the trades of druggists' sundrymen, retail druggists, soap-makers, and horse and cattle medicine vendors.

We make and sell nothing but pills, and have testimonials from regular customers, residing in China, Australia, and every part of the civilised world, as well as from friends in almost every town and village in the kingdom; and our trade, which is constantly increasing, is perhaps four or five times as large as all the rest of our copyists put together.

The following are some of our Prices FOR CHEMISTS ONLY:—

We strongly recommend our Aperient Pills as a good general saleable Pill. These, with the Pharmacopœia Pills quoted below, are sent out to every part of the United Kingdom in half-pound parcels, package, postage, and carriage free, on the same day as the order is received; and, to avoid booking and other expenses, 1*d.* in the Shilling will be allowed if Stamps or P.O.O. are remitted with order.

Our Pills can also be obtained from any Wholesale Druggist. In ordering, please specify "Cox's Tasteless Pills."

QUOTATIONS FOR OTHER PILLS ON APPLICATION.

No. in Catalogue.	Pil. Aperiens et Cathartic.	Prices per Pound in Four or Five Grain Pills.	
		Coated.	Uncoated.
1 & 2	Pil. Aper. (Cox) c. Cal.	6/	5/
3 & 4	,, ,, (Cox) sine Cal.	6/	5/
193	,, Cathartic Fort. (Cox).	6/	5/
332	,, Cochia	5/	4/
	Pills of the British Pharmacopœia.		
6	Pil. Aloes. Barb.	6/	5/
8	,, ,, et Asafœtidæ	5/	4/
9	,, ,, et Ferri	5/	4/
10	,, ,, et Myrrh.	12/	11/
7	,, ,, Soc.	6/6	5/6

No. in Catalogue	Pills of the British Pharmacopœia.	Prices per Pound in Four or Five Grain Pills.	
		Coated.	Uncoated.
122	Pil. Asafœtidæ Co.	6/6	5/6
66	,, Cambog. Co.	6/	5/
24	,, Coloc. Co.	16/	15/
30	,, ,, et Hyos.	13/	12/
62	,, Ferri Carb.	5/	4/
71	,, Hydrarg.	5/	4/
92	,, ,, Subchlor Co.	6/6	5/6
77	,, Ipecac. c. Scillæ	7/	6/
90	,, Plumbi. c. Opio.	12/	11/
104	,, Rhei Co.	7/	6/
119	,, Saponis Co.	12/	11/
321	,, Scammon. Co.	22/	21/
115	,, Scillæ Co.	5/	4/

The Registrar of Trade Marks (after giving the usual public notice, prescribed by Parliament, to allow of opposition) has granted us the above "Trade Mark," thus officially recognising us as the "*Original Makers of Tasteless Pills*," and no Pills will be sent out without this Mark on all bottles or packages.

ARTHUR H. COX & CO.

TASTELESS PILL MANUFACTURERS,

ST. MARTIN'S PLACE, BRIGHTON.

Eight Grand World's Fair Medals. Orders received from all parts of the World.

Attention is specially called to WM. R. WARNER & CO.'S

PERMANENT AND SOLUBLE SUGAR-COATED PILLS

Of the British Pharmacopœia, and Recipes of eminent Pysicians, &c., &c.

PARVULES (Or Minimum Doses for Children and Adults).

INGLUVIN (A Potent Specific for Vomiting in Pregnancy, Pronounced Atonic Dyspepsia, &c., &c.).

AND OTHER APPROVED PHARMACEUTICAL PREPARATIONS.

Specimens of the numerous opinions which are from time to time received by the London Agents, from members of the medical profession who prescribe these preparations, or employ them in their practice:—

Messrs. WARNER & Co London, 24th Feb. 1881.

Gentlemen,—I have great pleasure in stating that I find amongst the many COATED PILLS I have used, yours, which are sugar-coated and pleasant to take, are by far the most soluble, and I can recommend them to practitioners in preference to all others, their action being sure.—Yours truly, C. J. RIX, M.R.C.S. Eng., L.M. and L.S.A. Lond.

Messrs. NEWBERY & SONS. March, 1881.

Gentlemen,—I have great pleasure in bearing testimony to the therapeutic value of Messrs. Warner & Co.'s PIL. CATHART CO. (VEGETABLE). During many years of active practice I have found nothing to equal them as an effective yet mild purgative. In costiveness arising from hepatic torpor, or obstruction in the Duct, the relief they afford both physically and mentally is most gratifying. I should now feel quite at a loss without them. Their unique appearance and pleasant taste well add to their reputation. The proprietors give the formula on each bottle.—I am, faithfully yours, ED. COTTEW, L.R.C.P., L.S.A. London.

Stanley House, Blackstock Road, Finsbury Park, N.
February, 1881.

Gentlemen,—With pleasure I testify to the elegance and efficacy of your SUGAR-COATED PILLS, having used them extensively,—and many of the different kinds,—and found their action certain. In a very extensive midwifery practice, I have also found INGLUVIN of very great service for all the purposes it is intended to effect.—JAS. CARNEGIE GIBSON, L.R.C.P., L.R.C.S., L.M.

Messrs. W. R. WARNER & Co.

8, Cumberland Terrace, Finsbury Park, N.,
25th February, 1881.

Gentlemen,—I have tried several of your SUGAR-COATED PILLS, and believe that they are most efficient in their action, and a dependable mode of administering medicine. They are certainly the best in appearance I have ever seen, and the most pleasant to take.—M. C. SOUTTER, M.R.C.S. Eng., &c.

Practitioners are requested to prescribe 'Warner & Co.' Should any Chemist not have in stock any desired formula, it will be mailed direct from the Depot on receipt of price.

Sole Depot in Great Britain:

F. NEWBERY & SONS (Estab. A.D. 1746), 1, King Edward St. London, E.C.

TOWLE'S CHLORODYNE

The Original Preparation, as approved by the Medical Profession on account of its known composition and uniform strength.

Retail at 13½d., 2s. 9d. & 4s. 6d. Dispensing, 4 ozs., 4s. 6d. & 10 ozs. 11s. stamped.

LIQ. CHLORODYNII,

As originally Introduced by A. P. Towle, and free from stamp duty for dispensing.

4 ozs., 4s.; ½ lb., 5s. 6d.; 1 lb., 10s.

TOWLE'S CHLORODYNE LOZENGES AND JUJUBES,

In 1, 2, and 4 lb. Bottles, at 3s. per lb., and 6d. and 1s. Boxes. Foiled, Lined and neatly got up for the counter, 4s. 6d. and 9s. per dozen.

A. P. TOWLE, Chlorodyne Manufacturer,

75, BACK PICCADILLY, MANCHESTER.

Bills with name on application with instructions for forwarding.

CAUTION.

Robinson's Concentrated Waters

(ESTABLISHED 1855).

Numerous complaints have been made to me of the inferior quality of "Concentrated Waters" supplied by several of the Wholesale Drug Houses. I now find it incumbent to state that during the last twenty-five years I have devoted a large portion of my time and attention to the improvement and perfection of these useful preparations, and that I have the satisfaction of knowing that they *now* occupy a more favourable position in the opinion of the Medical Profession and the Trade generally than at any other time. To guard against future disappointment it is necessary to see that each bottle has my protection label over the cork, without which no other is reliable.

Put up in ½lb. and 1lb. Bottles.

TESTIMONIALS.

From the LANCET, *July 15th*, 1882.

"CONCENTRATED WATERS (Robinson's, Pendleton, Manchester).—Among the samples sent to us we find Aq. Anethi, Anisi, Cinnam Ver., Rosæ, and some dozen of others. Diluted with forty parts of water they form the ordinary waters of the Pharmacopœia. They are *excellent in quality*, and will be very useful, especially in country practice."

From the LONDON MEDICAL RECORD, *December 15th*, 1879.

"MR. ROBINSON, of Manchester, has long had a great reputation for his Concentrated Waters, from which can be prepared the ordinary waters for dispensing. We have lately had an opportunity of examining some of the kinds in most general use—Cinnamon Water, Camphor Water, Peppermint Water, Rose and Elder Flower Waters—and it is satisfactory to see that these valuable old preparations continue to maintain and to deserve their place in public favour. Among the host of novelties yearly brought forth there is a liability to overlook these good old standard medicaments. How many of our mothers and grandmothers can testify to the comforting, soothing, and warming effects of a good dose of Peppermint Water. For all dispensing purposes these Concentrated Waters are reliable and excellent preparations."

PREPARED BY THE INVENTOR,

B. ROBINSON { **Manufacturing Chemist, Distiller, and Brewer of British Wines,** } **MANCHESTER.**

London Agents:—Messrs. HEARON, SQUIRE & FRANCIS.

ROBINSON'S ORANGE WINE

(VIN. AURANTII, B.P.)

Specially prepared for Quinine Wine, does not deposit, will keep good in any Climate, and well adapted for Export Trade. Supplied in Casks containing 9, 18, 30, 60, or 120 Gallons. Terms on application.

THE UNIVERSAL CORN AND WART PENCIL.

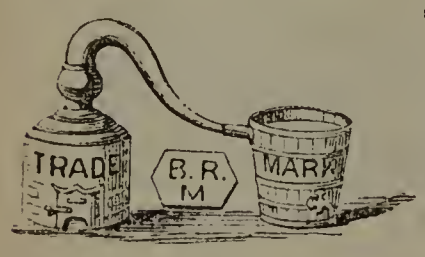
1 doz. mounted on a handsome Illustrated Show-Card, Retail, 6d. each; Wholesale, 3s. 6d. per doz. It is especially adapted for Export Trade, and may be safely sent to the hottest climates, as each glass tube is hermetically sealed and enclosed in a cardboard case.

N.B.—The above is exempt from Stamp Duty by permission of the Board of Inland Revenue.

CONCENTRATED WATERS.—One Ounce of these Waters added to

Forty Ounces of Distilled Water forms a clear Medicated Water (without filtering), similar in every respect to those prepared according to the directions of the British Pharmacopœia, and free from all Chemical impurity. They are prepared to supply a want long felt by Chemists and Medical Men, and by their use a fresh supply of any of the Medicinal Waters may be obtained at a moment's notice. They are not affected by age in any climate. N.B.—Used in the proportion of one part to thirty-two of water they represent the Medicinal Waters of the *United States Pharmacopœia.*

	Per lb.		Per lb.		Per lb
Aqua Anethi, Concent. ...	4/0	Aqua Cinnam. Ver. Concent.	6/0	Aqua Fœnieuli, Concent. ...	4/0	Aqua Pimentæ, Concent....	4/0
,, Anisi ,, ...	4/0	,, Cassiæ ,,	4/0	,, Menth. Pip. ,, ...	4/0	,, Rosæ ,, ...	/6
,, Camphoræ ,, ...	4/0	,, Flor. Aurant. ,,	8/6	,, ,, Ang. Con. ...	6/0	,, Rosæ Virgin ,, ...	0/6
,, Carui ,, ...	4/0	,, Flor. Sambuci ,,	8/6	,, ,, Virid. ,, ...	4/0		



The above are put up in Bottles of ½ lb. or 1 lb. and upwards, each of which has the Inventor's Protection Label over cork.

Wholesale Agents—Hearon & Co., Maw, Son & Thompson, Lynch & Co., London; Evans, Sons & Co., Liverpool; Woolley, Manchester; Bewley & Draper, Hunt & Co., Dublin; Glasgow Apothecaries' Co., Hatriek & Co., Glasgow; Raimes & Co., Duncan, Flockhart & Co., Edinburgh; Foggitt, Thirsk; Goodall & Co., Leeds; J. Richardson & Co., Leicester; Slinger & Son, York; McKesson & Robbins, New York. Special Terms for large quantities may be had from

B. ROBINSON,

Distiller and Brewer of British Wines, Church St., Pendleton, Manchester.

FOREIGN SPECIALITIES AND MEDICINES.

REVISED PRICE LIST, 1883.

ROBERTS & CO.

FOREIGN AND ENGLISH CHEMISTS, WHOLESALE, IMPORT, AND EXPORT AGENTS FOR FOREIGN MEDICINES AND PATENTS,

76, NEW BOND STREET, LONDON.

Messrs. Roberts & Co. beg to inform the Trade that they are Agents for all the principal French and Foreign Specialities and Medicines, a large supply of which they have always on hand, and can supply on very favourable terms. They are in *daily* communication with their Paris House, and can offer exceptional facilities for procuring New Medicines, &c., &c., with very little delay.

The following is a list of a few that they name *au hazard*, and that have a large sale :—

Retail	Per doz.
4/6...Alcool de Menthe Bicqles	44/
2/9... Ditto ditto	24/
2/9...Aubergier's Syrup	27/
1/9... ,, Pate	16/
6/6...Bay Rum	54/
3/6... Ditto	27/
2/0...Belloc's Charcoal	15/6
1/9... ,, Lozenges	13/
4/6.. Blancard's Pills	30/
2/6... Ditto	18/
4/6...Brou's Injection	27/
4/6...Buge 's Wine	35/
4/6...Bully's Vinegar	30/
2/6... Ditto	15/
4/6...Cardè's Lint (Antephioque)	36/
4/6...Capsules, Bromide of Camph.	45/
4/6... ,, Matico	33/
4/6... ,, Requin	30/
4/6... ,, Mathey Cayrus	28/
4/6...Chassing's Wine	39/
2/9... ,, Pills	25/

Retail	Per doz.
4/6...Clin's Bromide Camp Dragees	45/
5/0...Eau Botot	38/
3/0... Ditto	24/
2/6 . Espic's Cigarettes	14/
2/9...Flon's Syrup	23/
2/0...Gayetty's Paper	16/
2/3...Granules Arsen. Acid	15/
2/3... ,, ,, Iron	15/
2/3... ,, ,, Soda	15/
2/9...Grimault's Syrups	24/
2/3...Guyot's Goudron	18/
11/...Laville's Gout Tincture	90/
11/... ,, ,, Pills	90/
2/3...Papier Fayard	13/6
1/1½... Ditto	7/
4/0...Papier Fruneau	27/
2/3... Ditto	15/
1/9...Pâté Aubergier	16/
1/9... ,, de George	13/
1/1½... ,, ,,	8/6
2/0... ,, de Berthe	16/

Retail	Per doz.
1/9...Patê de Nafé	13/
1/9... ,, Regnauld	13/
7/0...Pierlot's Valerian	60/
2/9...Rabuteau's Dragées Ferrug	28/
7/ ... ,, Elixir Ferrug	65/
2/9... ,, Sirop Ferrug	27/
4/0...Racal out	32/
4/6...Reynal's Bougies	42/
2/9...Ricord's Injection	24/
4/6... ,, Capsules	38/
8/0... ,, Syrup	72/ ; 2/9 ; 26/
1/6...Star Paper	12/
2/9...Vallec's Pills	24/6
1/9... Ditto	14/
4/6...Velontine (White and Rose)	39/
3/6... Ditto ditto	30/
2/9...Vichov's Trochisques	22/
4/6...Valentine's Meat Juice	38/
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Special Quotations in large quantities.

MM. Roberts & Cie ont l'honneur d'informer MM. les Pharmaciens Spécialistes de France et de l'Etranger qu'ils se metten a leur disposition pour des depôts qu'ils voudraient établir a Londres. On peut avoir tous renseignements on s'adressant a leur maison de Londres ou à Paris.

Special Agents for Vin Mariani, Valentine's Meat Juice, and Le Grands oriza Perfumery.

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PETER MÖLLER'S COD LIVER OIL

The London Offices and Warehouse for PETER MÖLLER'S Cod Liver Oil are removed to 43, SNOW HILL, E.C. Chemists willing to use Show Cards, &c., are requested to make direct application. Möller's Cod Liver Oil can be obtained through any Wholesale House or from the London Office.

WILLIAM GRAHAM CARR & SONS,

Pharmaceutical Chemists,

IMPORTERS AND WHOLESALE DEALERS IN COD LIVER OIL,

BERWICK-ON-TWEED.

ESTABLISHED 1794.

OIL MADE ON THE PREMISES DAILY.

YOUNG & POSTANS' PHOSPHORISED COD LIVER OIL

THE ORIGINAL PREPARATION. BEWARE OF SPURIOUS IMITATIONS.

Vide the *Lancet, Brit. Med. Journ., Lond. Med. Record., Med. Times and Gazette, and Echo de la Press Medicale.* "In 1853, Dr. GLOVE recommended the use of Phosphorised Cod Liver Oil."—*The Lancet*, January 8, 1853. (A little over six years ago and more.)

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BEEF PEPTONOIDS

A Concentrated Powdered Extract of Beef, Partially Digested and Combined with an Equal Portion of Gluten.

"CARNRICK'S" BEEF PEPTONOIDS contain *only the nutritive portions* of the beef. It contains *no water* and *no inert matter* of any kind. We combine the dry Extract of Beef with an equal *portion* of Gluten to prevent a tendency to deliquescense, and in order to present the preparation in a powdered and portable form. It is well known that Gluten is the most nutritious substance found in the Vegetable Kingdom, and in nutritive elements is closely allied to Beef.

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Four ounces of "CARNRICK'S" BEEF PEPTONOIDS contain more nutritive elements than ten pounds of any Extract made by Liebig's formula, and from four to six times more Albuminoids and Fibrinoids than any Beef Extract ever offered to the Medical Profession.

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"CARNRICK'S BEEF PEPTONOIDS" *is much less expensive than any other preparation in the market, as it contains neither water or inert matter.*

The favour our preparation of BEEF PEPTONOIDS received at the hands of Drs. AGNEW, BLISS, HAMILTON, REYBURN, WOODWARD, BARNES, &c., the corps of eminent Physicians, who employed the preparation with so much advantage in the treatment of the late PRESIDENT GARFIELD, proves conclusively its great value, not only as food to be taken by the mouth, but also how important an agent it has been found in feeding by the Rectum.

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Convalescence from all diseases, Fevers, Pneumonia, Weak Digestion, Diarrhœa, Dysentery, Phthisis, Cholera Infantum, Marasmus, Sea Sickness, Excessive use of Alcoholic Stimulants, Per Rectum in all cases where the stomach cannot digest the food, and in debility resulting from any cause. Also a valuable adjunct in voyages and camp life.

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CAUTION—Purchasers must insist on having the Liebig **COMPANY'S** Extract. For flavour and clearness pronounced by all competent authorities to be the best.

Invaluable in cases of debility and weak digestion.

N.B.—Genuine ONLY with facsimile of Baron Liebig's Signature, in blue ink, across label.

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ORIGINAL DANDELION COFFEE

Is warranted the best Article of the kind in the Market. Also the

NEW MALTED DANDELION COFFEE,

Which is a splendid preparation, and a large sale guaranteed to those introducing it.

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GELATINE POWDER

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Or from their Agents, W. B. FORDHAM & SONS, York Road, St. Pancras, London, and RAIMES & Co., Wholesale Druggists, Edinburgh.

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Guaranteed to contain the proportion of Nitrous Ether directed by the British Pharmacopœia.

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Respectively 8 and 4 times the strength of the Spirit.

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BEEF TEA — AI SAUCE — CAME PIES.

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TURTLE SOUP. — ZISNO RELISH — MEATS POTTED.

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GREAT REDUCTION IN PRICE.

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We pay Carriage on Extract Orders if amounting to 10 lbs. weight or over. Packages free.

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"Sandwich, Kent.—Therapeutically Mackeys' Quinquinine equals Sulphate of Quinine. It is a certain tonic in direct debility, and a sheet-anchor in all cases where fever remits or intermits. Personally, I have derived most marked and rapid relief from its use, in repeated attacks of lumbago, to which I am very subject. I take two grains every four hours, dissolved by the aid of Citric Acid, which is a combination I can strongly recommend.—THOS. HORNE, L.R.C.P."

Mr. F. OLDFIELD writes from Bloemfontein, S. Africa:—"Please send me Mackeys' Quinquinine, it suits here much better than Quinine." N.B.—ONLY THAT BEARING OUR NAME IS GENUINE.

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THE ORIGINAL AND ONLY TRUE.

In its composition and effects bears no resemblance whatever to any of the preparations sold, or the many formulæ published, but has curative properties peculiarly its own; nor is there any analytical test for it. It has been found by the Profession and large numbers of the Public to succeed after all imitations have failed, and maintains its unaltered position as the **only reliable Chlorodyne.** No other remedy known can be exhibited with so much confidence as a **Sedative,** an **Anti-Spasmodic,** an **Astringent,** an **Anodyne,** or **Diaphoretic.**

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"Having been in the habit of using Mr. Freeman's Chlorodyne for some time past, I have much pleasure in stating that it **has never failed to have the desired effect** in whatever case it has been administered."

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"It gives me great pleasure to bear testimony in favour of Freeman's Chlorodyne. I have prescribed it extensively, and in cases of Asthma, Chronic Bronchitis, the last stage of Phthisis, and the Winter Cough of the aged, I have never found any substitute or chemical combination its equal; moreover, in all cases where a Sedative is required, it is a certain, safe, and agreeable remedy."

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Lord Chancellor Selborne's judgment in the "Chlorodyne Suit," April 28th, 1873, condemned the proceedings of John Collis Browne and J. T. Davenport, and decreed them to **pay all costs.**—*Times,* April 29; *British Medical Journal,* May 3.

Lord Justice James, in his judgment, July 23, 1873, stated that "Freeman was entitled to call his **Chlorodyne** the **Original** and **only Genuine.**"

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FOR WHITE HANDS AND SOFT SKIN.

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TRADE MARK, "FLOATING."

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In ordering be sure to order Chequered Pumice FLOATING Hand Tablets, as there is an imitation in the Market which will not float.

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,, Magnolia ..	,, 9/6	,, Rose ..	,, 9/6	,, Tubereuse ..	,, 9/6	,, Wild Rose ..	,, 9/6
,, Orange Flower	,, 9/6	,, Rose Geranium	,, 9/6	,, Violet ..	,, 15/-	,, Ylang Ylang	,, 9/6

These Extracts have always had the highest reputation; they are all of our own manufacture, are guaranteed PURE, and of TRIPLE STRENGTH, and will compare favourably with any in the Trade.

LOW'S COMPOUND PERFUMES,

For Dilution by the Trade, are the Strongest in the Market, viz.:—

ESS. BOUQUET, JOCKEY CLUB, AND FRANGIPANNI. Price 14/- per lb.; or 13/- in Winchester Quarts.

This Soap is the result of considerable study and many experiments, the object desired being to produce a SOAP that would be **Quite Neutral,** *and thus innocuous to the most tender skin, yet one that would lather freely, and not waste quickly away. Price 33/- per Gross; or 11/- per doz. Boxes of 4 tablets.*

R. LOW, SON & HAYDON, Perfumers, Toilet Soap Makers, and Brush Manufacturers,
330, STRAND (opposite Somerset House), **LONDON.**

RIMMEL'S PERFUMERY AND TOILET SOAPS.

Egyptian Lotus, Ihlang-Ihlang, Jockey Club, White Heliotrope, White Lilac, Meadow Flowers, Magnolia, Malvetta, Wallflower, White Pink, New-mown Hay, Frangipane, and 100 other choice Handkerchief Scents, in plain or cut bottles.

Rimmel's Toilet Vinegar, an indispensable requisite in all families.
Rimmel's highly fragrant Lavender, and Florida Water.
Rimmel's Lime Juice and Glycerine, the best Preparation for the Hair.
Rimmel's Windsor, Honey, Transparent Coal Tar, and Glycerine Soaps.
Rimmel's Velvetine, Violet, Rice, and other Toilet Powders.
Rimmel's Aquadentine, a fragrant Floral Extract for the Teeth. White Rose Tooth Soap, in metal cases.

RIMMEL'S AROMATIC OZONIZER,

Or NATURAL AIR PURIFIER, a fragrant Powder, producing in dwellings or places of public resort the healthy emanations of the Pine and Eucalyptus Forests. In ¼-lb. Tins, price 1s. RIMMEL'S AROMATIC POCKET CASSOLETTE, 6d.

A wholesale Illustrated Price List sent on application to

EUGENE RIMMEL,

Perfumer by Appointment to H.R.H. the Princess of Wales,
96, STRAND, LONDON.

PRICE'S PATENT CANDLE COMPANY (Limited).

Works:—Battersea, London, & Bromborough, Liverpool.

Price's Pure Glycerine for Medicinal Purposes.

Price's Glycerine for Ordinary Use.

Price's Glycerine Soaps.

Price's Carbolic Disinfecting Soaps, for Nursery, Bath-room and Household Purposes.

Price's Carbolic and Glycerine Soap.

GOLDEN MACASSAR OIL

MESSRS. A. ROWLAND & SONS, OF 20, HATTON GARDEN, LONDON, beg to announce that their Macassar Oil can now be had in a Golden Colour, as well as in the usual tint. This Golden Macassar Oil is specially suited for fair-haired children and people. Sizes and Prices as usual.

ROWLANDS' EUPLYSIA

Is a botanical wash for cleansing the hair and skin of the head from all impurities, scurf or dandriff.
2s. 6d. per Bottle.

ROWLANDS' EUKONIA

Is a fragrant toilet powder, lately much improved. Each box has inside the lid a certificate of purity from Dr. Redwood, Ph.D., F.C.S., &c.
Sold in three tints: white, rose and cream, 2/6 per Box; double that size with puff, 4/-

Counter Bills and Dummies can always be had on stating to what Wholesale House in London they may be sent for enclosure.

A. ROWLAND & SONS, 20, HATTON GARDEN, LONDON,

Will always be glad to advertise in any price lists, almanacks, &c., published by chemists, on receipt of particulars.

TITLE SECURED.

B DENTIFRICIUM B

PRICE 2/6.
Cases of Six 14/-.

TRADE MARK 27668.

INVENTED BY A TALENTED PHYSICIAN.

RECOMMENDED BY EMINENT SURGEON-DENTISTS.

Patronised by the "Monde élégant" as the best and most agreeable liquid Dentifrice yet introduced.

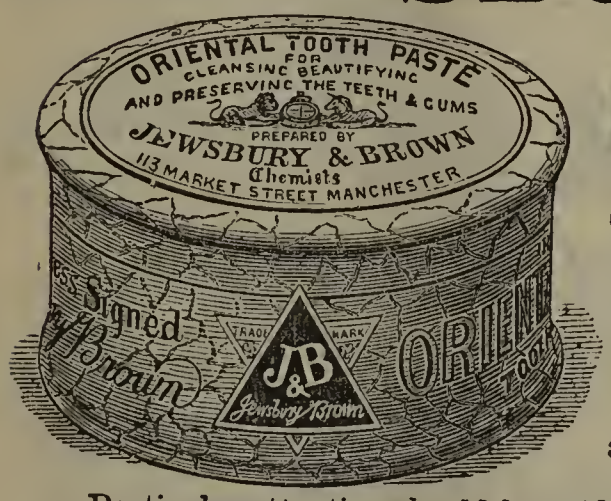
Proprietors, **BARTON BROTHERS, BRIGHTON.**

Also Sole Proprietors of the Original

"BRIGHTON GLYCERINE CREAM."

Wholesale from Messrs. BARCLAY, E. CLEAVER, EDWARDS, NEWBERY, SANGER, SUTTON, &c.

JEWSBURY & BROWN'S ORIGINAL ORIENTAL TOOTH PASTE.



SOLD AT 1/6 & 2/6 PER POT.

This old-established Dentifrice has been **Fifty Years** before the public.

IT IS WARRANTED TO RETAIN ALL ITS VALUABLE PROPERTIES IN ANY CLIMATE.

The **ORIGINAL** and **ONLY GENUINE** is manufactured solely by

JEWSBURY & BROWN,

CHEMISTS, MANCHESTER,

and is distinguishable by the **AUTOGRAPH SIGNATURE** of the Proprietors on each wrapper and the **TRADE MARK** on the label round the pot.

Particular attention should be paid to this guarantee of genuineness, as **numerous imitations** are offered.

The Trade and Shippers supplied by the leading houses in London and elsewhere. Bills and Show Cards forwarded by the Proprietors, JEWSBURY & BROWN, Manchester, on receipt of address card, and directions for enclosure.

CHARRAS & CO.

NYONS (DROME), FRANCE.

NEW YORK:—Warehouse at 36, PLATT STREET.

SPECIAL DISTILLATION OF

ESSENTIAL OILS

LAVENDER, ROSEMARY, FENNEL, ORIGANUM, SPIKE, RED AND WHITE THYME.

SAMPLES SENT ON APPLICATION.

G. B. Kent & Sons' List of Brushware.

AUTUMN 1882.

Contains 86 pages and 536 illustrations, and may be had by the trade on application.

The publication of this List has been delayed because the prices of Bristles have been continually advancing. The present List is based on the average value at Midsummer, 1882, since which time a considerable increase in the cost of Bristles has taken place.

The labour of calculating the value of so many articles, and the cost of publishing such a catalogue are obviously great, therefore **G. B. KENT & SONS** have decided to adhere to these printed prices until the Spring of 1883, when it will be necessary to advance many of them, unless the prices of Bristles are easier than they are to-day.

Buyers of **G. B. KENT & SONS' BRUSHWARE** will be wise to keep up their stock, as there is every probability of higher prices ruling next Spring.

As Importers of Bristle and Dealers in Raw Material (see page 86 in List), **G. B. KENT & SONS** have facilities, which are possessed by few, of producing the best Goods at the lowest prices, whilst their command of machinery greatly reduces the cost of labour, and improves the style and finish of their Goods.

Important additions are now being made to their Works at Victoria Park, rendered necessary by an increasing demand for their brand of **BRUSHES**.

The trade may be assured that no alteration in the cost of Bristle will cause **G. B. KENT & SONS** to deviate from their well-known standard. Their Goods are of the same high quality that they have been in the past. The fourth generation, with an increasing business, are not likely to allow any deterioration.

November, 1882. LONDON, 11, GREAT MARLBOROUGH STREET, W.

SPECIAL QUOTATIONS. ESTABLISHED 1777. PRICE LISTS ON APPLICATION.

PERFUMERY Of every known kind **T. F. BRISTOW & CO.** TOILET SOAPS Of every description.

Wholesale Perfumers and Fancy Soap Makers.

Concentrated (various) CHOICE ESSENCES

IN BULK.

No. "30," 12s. for 20 fluid ounces.
No. "24," 9s. 6d. ,, ,,
No. "18," 8s. ,, ,,

AND IN doz.

Corked Bots. 3/6 4s. 7s. 8s. 12s.
Sprinklers... ... 4s. 7/6 8s. 12s.
Stoppered Bots. 9s. 12s. 14s. 18s. and upwards.

POMADES, &c.

doz.

Assorted (tall or squat) 4s. & 8s.
Nursery (large) .....4s. & 9s.
Lime Juice & Glycerine 4/- & 7/6
Glycerine & Lime Cream 4/- & 7/6
Brilliantine ..... 8s. & 12s.
(separable and unseparable).
Brilliantine (white Rose) Stoppered Bottles....8s. & 12s.
Cherry Tooth Paste.....4s. & 8s.
Areca Nut ,, ...4s. & 8s.
Lip Salve in Pots and Sticks .....4s. & 8s.

Special Soaps in boxes.

Cold Cream Soap, doz.
3 tabs. in box 12s. & 20s.
Coal Tar Soap do. 8s. & 12s.
Carbolic do. 8s. & 12s.
Glycrne. & Oatmeal do. 8s. & 12s.
,, Transparent do. 8s. & 12s.
,, and Carbolic do. 8s. & 12s.
Lavender (Sweet) do. 8s. & 12s.
Baby Soap, 4 tabs in box ....9s.
,, ,, 12 do. ....27s.
Family Economic 4 do. .... 8s.
,, ,, 12 do. ....24s.
Thymol, 3 tabs in box.. 8s. & 12s.

Medicated Soaps

(IN WRAPPERS).

Carpet & Cloth Soap 3s. 6d. & 7s. dz.
Dog Soap .....3s. 6d. & 7s. ,,
Coal Tar (Family) 18s. & 27s. gr.
Carbolic 18s. & 27s. ,,
Camphrtd. Winter 27s. & 39s. ,,
Fullers Earth.....3s. 6d. doz.
Jewellers.....4s. ,,
Petroleum .....4s. ,,
Pumice Stone.....3s. 9d. ,,
Juniper Tar.....4s. ,,
Sulphur .....4s. & 8s. ,,
Zinc.....4s. & 8s. ,,

Honey, Brown Windsor, Glycerine, and other Soaps in Tablets and Ovals, at 56/-, 64/-, 74/, 84/-, and 112/- per cwt.

5, BISHOPSGATE AVENUE, CAMOMILE STREET, LONDON.

ROBARE'S AUREOLINE,

OR GOLDEN HAIR WASH.

The attention of the Trade is respectfully called to the above Article, now having a large sale, and giving an excellent profit to the retailer.

5/6 size - - - - - - 36/- per dozen.
10/6 ,, - - - - - - 72/- ,,

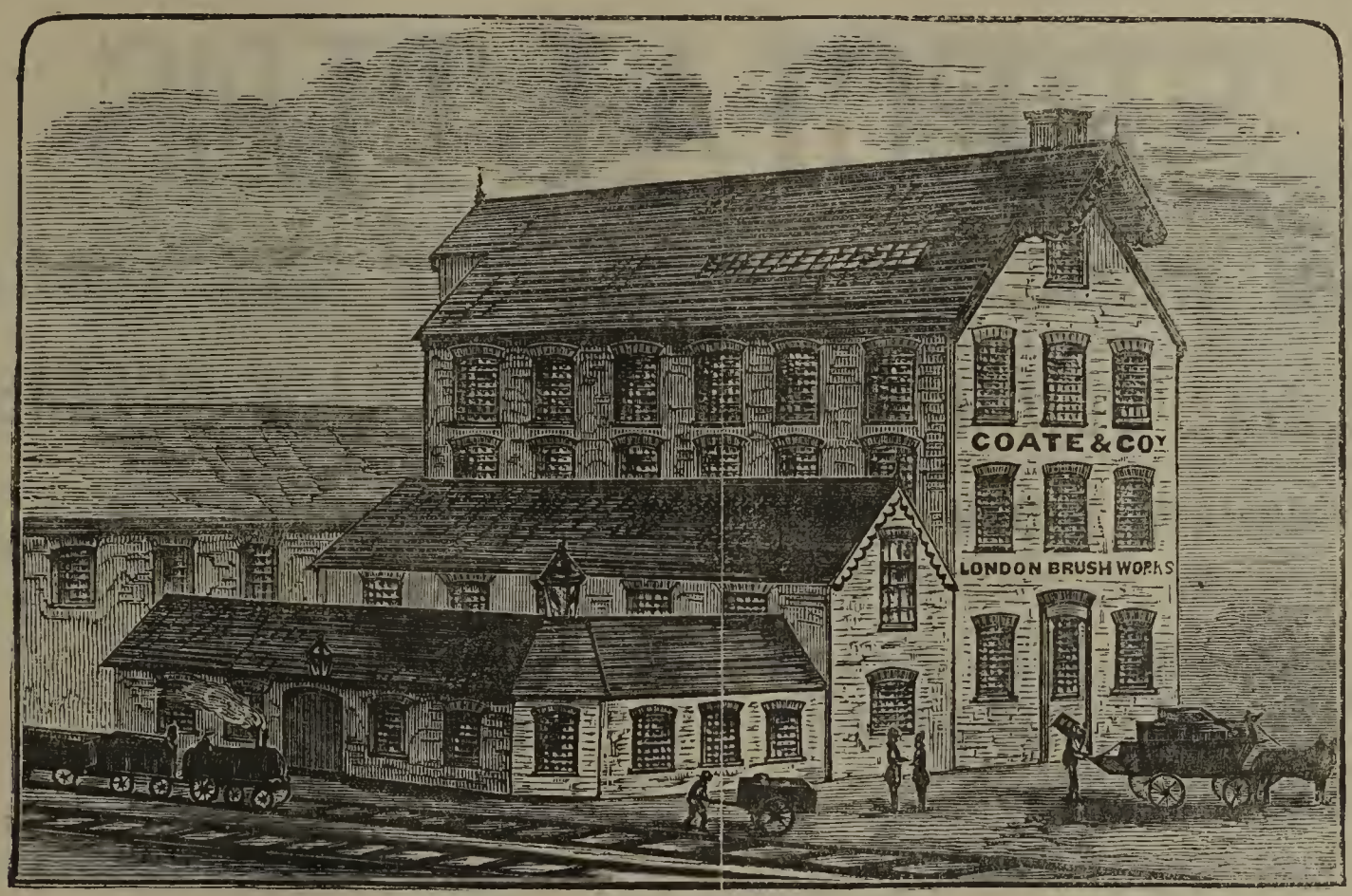
Sole Wholesale Agents, R. HOVENDEN & SONS, LONDON.

NOTICE OF REMOVAL.

COATE & CO.

LATE OF

41, LISLE STREET, LEICESTER SQUARE, LONDON, W.



HAVE for several years past found it impossible to give that room and accommodation for PACKING, STAMPING STORING, &C., which their growing business requires, as during the past year or two they have been favoured with a larger supply of orders than ever before, and although they often hold in Stock from Two to Three Thousand Gross of Tooth, Hair, Nail, and Cloth Brushes, made and partly made, yet from the limited accommodation which their Warehouse afforded they were unable to give their customers the full benefit of that Stock in the due and prompt execution of orders in reasonable time. They therefore resolved to move their Warehouse and Offices to their newly acquired Freehold Premises at

AXMINSTER, DEVON

(as shown above), where they have ample room for training a sufficient staff in that special technical knowledge so requisite for their peculiar trade.

And they have reserved Land for the erection of any additional Workshop-accommodation which may be required from time to time, and are fitting up their Factory with the lastest improvements in all that relates to Toilet Brush Manufacture.

Chard being only seven miles from Axminster, they will carry on their Branch Works at Chard as heretofore. But all Sales, Orders, and Correspondence will be carried on at and from Axminster.

It is now 36 years since COATE & Co. established their special Factory for the manufacture of **Tooth, Hair, Nail, and Cloth Brushes**, in London, since that time the smoke in the atmosphere has so increased, that it has become impossible to produce and finish their style of Brushes in London—a pure, clean atmosphere being indispensable, which they find here in perfection. They have also water power from the River Axe.

And to meet the requirements of the Trade, when Brushes are wanted by return, COATE & CO. have made special arrangements with MESSRS. BARCLAY & SONS, 95, Farringdon Street, who will hold a general stock of Coate's well-known Tooth Brushes, in all qualities, and supply the trade at C. & Co.'s prices.

But in all cases where Brushes are required to be stamped with Customer's name, orders will be received and executed through MESSRS. BARCLAY & SONS, or by COATE & Co. direct, with as little delay as practicable.

COATE & CO. have arranged with CARTER, PATERSON & CO., CARRIERS, GOSWELL ROAD, LONDON, to receive and distribute all their Goods to the several Railways, Parcel Companies, and Wholesale Houses as ordered by their Customers.

But Goods ordered to "wait instructions for forwarding" will, when such order is completed, be sent to the Carriers, CARTER, PATERSON & Co., LONDON, and the invoice, with post card enclosed, sent to customers on the same day as the Goods are sent off. COATE & Co. therefore beg customers, on receipt of invoice, to advise CARTER, PATERSON & Co. by what means they are to forward the Goods on to them.

With these increased facilities, they hope still further to merit a continuance of the favours bestowed on them for so many years past.

The London Brush Works, Axminster, Devonshire, England. **COATE & CO.**

MARCH, 1882.

ILLUSTRATED CATALOGUE POST FREE ON RECEIPT OF BUSINESS CARD.

A FEW OF

S. MAW, SON & THOMPSON'S

SPECIALTIES

Well worth the attention of the Trade.

SPECIAL QUOTATIONS TO WHOLESALE BUYERS.

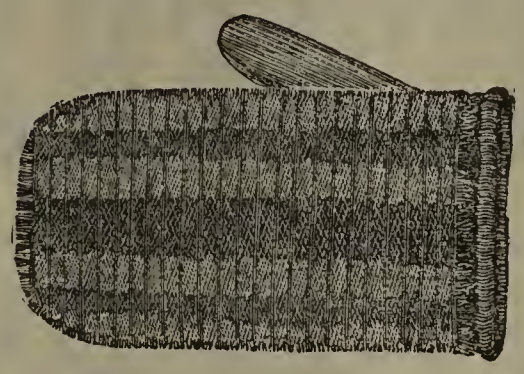
MAW'S AROMATIC TOOTH PASTE	...	Per dozen, 12/.
MAW'S CHERRY TOOTH PASTE	...	Per dozen, 4/ and 7/6.
MAW'S CACHOUS AROMATISES	...	Per dozen, 2/6.
MAW'S INDELIBLE MARKING INK	...	Per dozen, 3/ and 6/.
MAW'S SAUCE PIQUANTE	... ...	Per dozen, 9/ and 15/.
MAW'S VIOLET POWDER	... ...	*See* Price Current, page 124.
MAW'S ADHESIVE PLASTER	... ...	*See* Price Current, page 88.
MAW'S ATMOSPHERIC ODORATORS	...	*See* Price Current, page 53.
MAW'S BREAST RELIEVERS	... ...	*See* Price Current, page 61.
MAW'S CHEST PROTECTORS	... ...	*See* Price Current, page 65.
MAW'S COURT PLASTER	... ...	*See* Price Current, page 117.
MAW'S CORN PLASTERS	... ...	*See* Price Current, page 117.
MAW'S ELASTIC STOCKINGS, &c.	...	*See* Price Current, page 35.
MAW'S ENEMA APPARATUS	... ...	*See* Price Current, pages 39 to 41.
MAW'S PATENT FEEDING BOTTLES	...	*See* Price Current, pages 69, 70.
MAW'S FLESH GLOVES and RUBBERS	...	*See* Price Current, page 72.
MAW'S INCORRODIBLE RESPIRATORS	...	*See* Price Current, page 47.
MAW'S INHALERS	...	*See* Price Current, page 76.
MAW'S LINT (TAYLOR'S PATENT)	...	*See* Price Current, page 79.
MAW'S PERFUMERY, &c.	... ...	*See* Price Current, pages 117, 118.
MAW'S SMELLING BOTTLES	... ...	*See* Price Current, pages 95, 96.

S. MAW, SON & THOMPSON, ALDERSGATE STREET, LONDON.

DINNEFORD'S

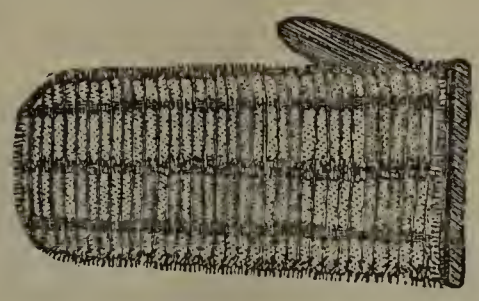
HORSE-HAIR FLESH GLOVES,

BELTS, BATH BRUSHES, &c.



GENT'S FLESH GLOVE (In Pairs).

Best quality, in grey and black hair of various degrees of hardness. A healthy and invigorating frictor for regular daily use. A positive luxury before a shower or sponge bath. 5/ per pair, retail.

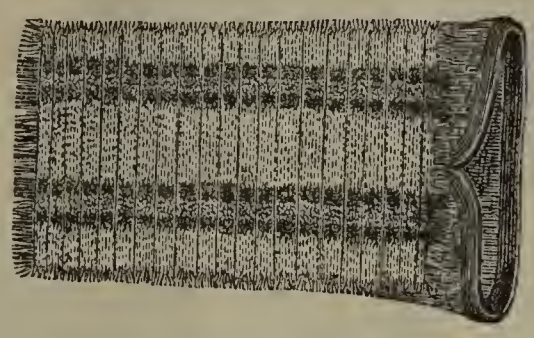


LADY'S FLESH GLOVE (In Pairs).

In light hair; for promoting a healthy action of the Skin. Anti-rheumatic and invigorating. 5/ per pair, retail.

CLARENDON FLESH RUBBER.

Hair on both sides. One surface is soft, the other hard; either may be used for friction. Suited to the most DELICATE skin. 3/6 each, retail.



PRINCE OF WALES BATH GLOVE.

For wet or dry use. Very durable, healthful, and refreshing. A necessary addition to a Turkish or warm bath. 2/6 each, retail.

ALEXANDRA BATH BRUSH.

Hair on both sides; on a long handle. Most convenient and refreshing for the bath. 2/6 each, retail.

ARMY BATH PAD.

For wet or dry use. Hair on both sides; indispensable for the bath. Convenient and portable. 2/ each, retail.

OXFORD WASHING PAD.

For readily cleaning and softening the hands, and for the bath. 1/ each, retail.

FLESH STRAPS, OR BELTS, AND BATH STRAP.

5/ each, retail. Hair on one side. LADIES' quality, light hair and soft pile. GENTS' quality, black or grey, and pile of various degrees of hardness. Specially useful for rubbing the back, spine, and shoulders. An excellent anti-rheumatic, and very invigorating. Bath straps, for wet use.

The Dry Frictors should be used immediately after rising, and just before the shower, sponge, or plunge bath. The most delicate can in this manner enjoy the luxury of a cold bath without the risk of taking cold. A few minutes' friction at bed time will prevent that irritability which so often arises from imperfect action of the skin.

Manufactured by DINNEFORD & CO. the Original Patentees,

180, NEW BOND STREET, LONDON, W.

FIRST ORDER OF MERIT AWARDED AT MELBOURNE EXHIBITION, 1880.

PRIZE MEDALS, INTERNATIONAL EXHIBITIONS.

LONDON, 1862.

PARIS, 1875.

PHILADELPHIA, 1876.

PARIS, 1878.

SYDNEY, 1879.

KILNER BROTHERS,

MANUFACTURERS OF

GLASS BOTTLES,

Of which the following are principal kinds:—

DRUGGISTS' BOTTLES, for Powders, Pills, Acids, Citrate of Magnesia, and other products supplied by Chemical Manufacturers and Wholesale Druggists.

CASTOR OIL, COD LIVER OIL, and HAIR OIL BOTTLES of various shapes, plain and fancy, with or without stoppers.

CARBOYS for Vitriol, &c., of all sizes, with or without Baskets.

DISPENSING and OTHER BOTTLES, both green and white, for the use of Chemists, Surgeons, and Manufacturers of Patent Medicines, &c.

PERFUME BOTTLES, in different sizes and shapes, suitable for both the Wholesale and Retail Trade.

MINERAL WATER BOTTLES for all kinds of Aërated Drinks, of every shape and colour, suitable either for Corks, or the various Patent Stoppers now in use.

WINE AND SPIRIT BOTTLES, of various shapes and sizes, and in suitable colours. **ALE** and **STOUT** Bottles in the dark green colour now so much preferred, both for Corks and Screw Stoppers.

CONFECTIONERS' BOTTLES, with or without Stoppers, comprising Drops, Barley Sugars, Jellies, Rock, Jam, and Marmalade Jars.

PICKLE, SAUCE, VINEGAR, and Wholesale Oilmen's Bottles in great variety, with or without stoppers.

We ask special attention to our **GLASS MEASURES.** They are made of the *very best* quality of glass, and the accuracy of the graduations is verified. *PRICES* (*including stamping in accordance with the new Act*):—

1 dr.	2 dr.	½	1	2	3	4	6	8	10	12	16	20	32	40 oz.
9/-	10/6	8/6	9/6	10/6	12/6	14/-	17/-	18/-	20/-	22/-	25/-	28/-	35/-	39/- per dozen.

DISCOUNT ACCORDING TO QUANTITY ORDERED.

We beg to solicit Orders for our Feeders,

"OUR DARLINGS' BOTTLE."

With Ebony Screw Cap, and Black Fittings

(1/- Retail)

96/- per Gross.

"OUR BABIES' BOTTLE."

(6d. Retail) **36/-** **38/-** **42/-** AND **44/-** per Gross.

(1/- Retail) **75/-** AND **81/-** per Gross.

(1/6 Retail **108/-** AND **120/-** per Gross

Terms and Discounts forwarded on receipt of application stating quantity required.
Large buyers liberally treated with.

LONDON OFFICES AND WAREHOUSES:

No. 10a, Great Northern Goods Station, King's Cross.

WORKS:—THORNHILL LEES AND CONISBORO', YORKSHIRE.

Illustrated Price Lists and Samples forwarded on Application.

THE LUNG PROTECTOR

(REGISTERED).

CHEST PROTECTORS.

MANUFACTURER,

GEORGE PATTISON

LONDON.

BATH AND FLESH GLOVES.

CORN AND BUNION PLASTERS.

BISHOP'S
GRANULAR EFFERVESCENT SALTS

Established 1857.

The LANCET, writing of Bishop's Preparations, says—"Their excellence is well known."
The BRITISH MEDICAL JOURNAL says—"The name of Mr. Bishop is a sufficient guarantee that the article is skilfully prepared."

BISHOP'S
Granular Effervescent Citrate of Caffeine.

THE BEST KNOWN REMEDY FOR HEADACHE.

This Salt has been most extensively used as a remedy for sick headache, and with such great success, that it may almost be called a specific. It relieves all disorders of nerve-function, and is at the same time most cooling and refreshing.

BISHOP'S GRANULAR EFFERVESCENT CITRATE OF CAFFEINE is sold in bottles at 2s. 6d. each. With each bottle is supplied a wooden Measure Cup, which when filled, but not heaped, gives an exact dose. The Granular Effervescent Citrate of Caffeine should be taken at the commencement of an attack of headache, and the dose should be repeated in an hour if any pain should remain. Testimonials from the most eminent medical men in the profession enclosed with each bottle.

An eminent Birmingham Physician writes:—"I like the EFFERVESCENT CITRATE OF CAFFEINE prepared by Bishop very much. It is a particularly valuable medicine as a morning restorative; and after brain exhaustion, or where sedentary occupation have reduced the tone of the system, it may be taken with perfect safety and great advantage."

BISHOP'S
Granular Effervescent Citrate of Potash.

Contains eight grains of this anti-febrile salt in each drachm, keeps well, and yields a delicious effervescent draught. It is more efficient, more economical, and more convenient than the ordinary alkaline waters, and much superior to the various mixed powders, which consist mainly of Tartrate of Soda.

The late Mr. Fewtrell, Analytical Chemist, wrote:—"It is the nicest effervescing preparation I have ever tasted, and is infinitely pleasanter than the bottled waters."

Dr. G. O. DREWRY, in his "Common Sense Management of the Stomach," recommends for Indigestion, Constipation, &c., the "GRANULAR EFFERVESCENT CITRATE OF POTASH" as a very agreeable, mild, and cooling laxative, when taken in doses of one dessertspoonful in half-a-pint of water before breakfast.

BISHOP'S
Granular Effervescent Mineral Water Salts.

For the preparation of artificial waters, these Granular Effervescent Salts are especially suitable. They give a refreshing draught, and may be relied on as presenting at the same time the chemical ingredients of the natural waters. It is obvious that in this form the Granular Effervescent preparations present many advantages over the waters themselves. Whilst all the constituents of the natural springs are reproduced, the Salts are extremely portable, more economical, and with them a sparkling refreshing draught is procurable in any quantity at any time. Among the Mineral Water Salts thus prepared may be named, CARLSBAD, KISSINGEN, PULLNA, SELTZER, VICHY, LITHIA, FRIEDRICHSHALL, &c. &c. In each case a teaspoonful of the Salt in half-a-tumbler of water will produce a draught similar in effect to the natural water. The Seltzer Water has been long recognized, both in this country and in Europe, as an excellent tonic and mild aperient.

BISHOP'S
Granular Effervescent Citrate of Magnesia.

A perfectly white and delicately clean preparation, prepared from salts obtained from the Pure Fruit Juices of Lemons and Grapes.

The best chemists in Great Britain and the Colonies keep no other "Granular Effervescent Citrate of Magnesia" than "Bishop's." The reason for this universal preference is that, since its introduction in 1857, it has been found that none of the Imitations of this preparation, *originally introduced by Mr. Bishop*, have been able to compare with it in reliability as a medicine, or in *purity* and *freshness of flavour* as a *cooling drink* Full directions on each bottle.

Sold in convenient sizes to suit the Buyer.

Report on Mr. Bishop's Granular Effervescent Preparations. By Prof. Attfield, Ph.D., F.R.S., F.I.C., F.C.S., Professor of Practical Chemistry to the Pharmaceutical Society of Great Britain, Author of a Manual on General Medical and Pharmaceutical Chemistry.

Mr. Bishop's Granular Effervescent Preparations have been known to me for more than twenty years. The maker has submitted to me the formulæ for them; I have seen them compounded at his factory; I have more than once tested the materials he uses; I have many times analysed the finished products. The formulæ are excellent, the ingredients pure, the processes perfect, the products all that can be desired.

(Signed)

JOHN ATTFIELD.

London, Dec. 6, 1881.

Observe the Name on the Seal, the Registered Trade Mark on the Label, and full address of

ALFRED BISHOP, *Manufacturing Chymist,*
17, SPECK'S FIELDS, Mile End New Town, London.

Messrs. JOHN WYETH & BROTHER are Sole Agents in the United States for Mr. Bishop's Preparations, and keep Stock of all the above Products.

ROBERT GIBSON,

MEDICATED LOZENGE MANUFACTURER,

CARLTON WORKS,

ERSKINE STREET, HULME, MANCHESTER,

AND

NO. 1, AUSTRALIAN AVENUE, LONDON.

ORIGINAL MAKER OF

GIBSON'S CHLORODYNE LOZENGES.

CHLORODYNE JUJUBES, GLYCERINE PASTILLES,

DELECTABLE AND VOICE JUJUBES.

IN DECORATED TINS. TINS NOT CHARGED.

GIBSON'S ORIGINAL SUGAR WORM CAKES

Have an immense sale, both at home and abroad; will keep in any climate, and give universal satisfaction.
Put up in Tins, containing 3 dozen, 6 dozen, or 12 dozen 1d. Cakes.

GIBSON'S BOILED SUGARS

Have gained a high reputation, both at home and abroad. Are made of the best Loaf Sugar, and are equal to, if not surpassing, all others.

PACKED IN CASKS OR CASES FOR EXPORT, DELIVERED FREE ON BOARD.

Carriage paid upon six 4-lb. Bottles to any part of England.

GIBSON'S COUGH DROPS, LIME FRUIT DROPS, AND ACID DROPS.

Especially Recommended.

THROAT HOSPITAL LOZENGES

(as per T. H. Pharmacopœia).

All Lozenges are sent out in 2-lb. and 4-lb. Bottles (bottles free), but allowed for if returned.

Proprietary Lozenges carefully prepared, stamped, and cut to any size or shape.

PRICE LISTS SENT ON APPLICATION.

SOLE AGENTS FOR THE UNITED STATES:

HOLWAY, WRIGHT & MINER,

NEW YORK: 167, CHAMBERS STREET. **BOSTON: 135, STATE STREET.**

NEPENTHE.

OR

ANODYNE TINCTURE.

PREPARED EXCLUSIVELY FROM OPIUM.

THE SAFEST AND BEST PREPARATION OF OPIUM,

Produces neither Headache, Sickness, nor Constipation.

Messrs. FERRIS & Co. beg to direct the attention of the Profession to the following important and unsolicited testimonial to the value of Nepenthe, which they have received from GEO. C. SEARLE, Esq., of Brixham, Devon, M.R.C.S., L.S.A., Medical Officer of Health, Brixham, &c.:—

BRIXHAM, *October*, 1881.

GENTLEMEN,—I should like to bring before your notice the very great benefit two patients of mine have derived, and are still deriving, from the continued use of NEPENTHE.

The first case is that of an old lady nearly 80, who has been suffering now for many years from an ulcerated leg, accompanied at night with very great pain, so much so as to prevent her sleeping. About eight years ago I persuaded her to try a dose of NEPENTHE at bedtime, and she has continued taking a dose regularly *every night ever since*, without any of the bad symptoms generally induced by the continued use of an opiate, but on the contrary, is now, although so aged, in better health than she was eight years ago.

The other case is that of a cancer of the face and neck (a very bad case): here there was an intensity of pain which nothing seemed to relieve, although opium, morphia, chloral, and every other sedative which could be thought of had been tried. I at last tried the NEPENTHE, and the result has been an entire cessation of the pain, which has not yet returned, although he has had the medicine now for some weeks. I may mention that in the first case it has not been necessary to increase the dose, and in the latter not to any great extent, which I consider another great advantage NEPENTHE possesses over other preparations of opium.

GEO. C. SEARLE.

From "The Lancet," December 18, 1869.

"NEPENTHE, or ANODYNE TINCTURE, prepared by Messrs. FERRIS & Co., Bristol.—This preparation really consists, as stated, solely of opium, resembling somewhat the liquid extract of the *British Pharmacopœia*. It is claimed for it that it does not produce headache, stupor, giddiness, depression of spirits, diminution of nervous energy, prostration of strength, nor constipation; it is doubtless less stimulating than those preparations of opium made with the solid and crude drug; and a further commendation of NEPENTHE is its uniformity of strength. The NEPENTHE intended for subcutaneous injection is of double the ordinary strength; and that it is really so we have verified by analysis."

NEPENTHE may be used with perfect safety in every case where an opiate is indicated, and from the peculiar process by which it is prepared it is deprived of all constituents which render the Tinctura Opii, and other forms of opium, in very numerous instances wholly inadmissible. It is also of uniform strength, and in this respect possesses high advantages.

NEPENTHE does not produce headache, stupor, giddiness, depression of spirits, diminution of nervous energy, prostration of strength, nor constipation, but induces natural and refreshing sleep.

Dose—the same as that of Tinctura Opii. Price, 8s. per lb.

Double-strength Nepenthe for Subcutaneous Injection. Price, 16s. per lb.

May be procured direct from the Sole Manufacturers—

FERRIS, BOORNE, TOWNSEND & BOUCHER,

Wholesale and Export Druggists, BRISTOL,

And through all leading Wholesale and Retail Chemists in Great Britain and the Colonies.

NOTICE.—Messrs. Ferris & Co. are the ONLY Manufacturers of Nepenthe, and medical gentlemen and the Trade are especially cautioned against using any preparation which does not bear their name and label.

N.B.—Nepenthe is registered under the Trade Marks Act, and protected by a facsimile of our signature pasted over each cork, and is sent out in bottles from 4 ounces upwards, bearing a label in white letters upon a green ground.

Special Wholesale and Export Terms for NEPENTHE on application.

SQUIRE'S
CHEMICAL FOOD.

[*Syrup: Ferri. Phosph. Comp. (Squire's).*]

P. & P. W. SQUIRE, who have for many years been the SOLE AGENTS, have purchased the right and all particulars relating to the manufacture of

PARRISH'S CHEMICAL FOOD,

As prepared by the late Mr. EDWARD PARRISH.

This tonic has stood the test of time, having been more generally prescribed for the last 20 years than any other preparation of the kind. It is most peculiarly suited for delicate children, not only from its bone-forming properties and agreeable taste, but also from the fact of its containing no poisonous ingredient, which might interfere with its prolonged administration.

TO DISTINGUISH THIS PREPARATION ORDERS SHOULD BE WRITTEN "SQUIRE'S CHEMICAL FOOD."

SQUIRE, 413, Oxford Street, London,

CORNER OF DUKE STREET, GROSVENOR SQUARE, W.

PARKE, DAVIS & CO.

MANUFACTURING CHEMISTS,

DETROIT, MICH. & NEW YORK CITY, U.S.A.

We beg to call especial attention to the following more important of our recent introductions, which have been before the Medical Profession of America for some years, and have lately been introduced in the United Kingdom.

Fluid Extract BERBERIS AQUIFOLIUM: A new Vegetable Alterative of peculiar value in chronic scaly eruptions of the skin.

Fluid Extract BLACK HAW (Viburnum Prunifolium): A decided Uterine Sedative, and held to be almost a specific in habitual abortion.

Fluid Extract CASCARA AMARGA (Picramnia): Introduced from Mexico. A very valuable Anti-syphilitic.

Fluid Extract CASCARA SAGRADA (Rhamnus Purshiana): A Tonic Laxative of very superior value in chronic constipation.

Fluid Extract CHEKEN (Myrtus Chekan): A Remedy for chronic bronchitis, winter cough, &c.

Fluid Extract CORN SILK (Stigmata Maidis): A recent introduction in the treatment of catarrhal cystitis.

Fluid Extract DAMIANA (Turnera Aphrodisiaca): An Aphrodisiac of very decided properties, and much esteemed in the treatment of impotence.

Fluid Extract GELSEMIUM SEMPERVIRENS: A direct nervous and indirect arterial Sedative, and a remedy which has been found valuable in remittent fever.

Fluid Extract GOLDEN SEAL, AQUEOUS (Hydrastis Canadensis): Tonic and Alterative, with especial determination to mucous surfaces.

Fluid Extract GRINDELIA ROBUSTA: The noted California remedy for spasmodic asthma.

Fluid Extract JAMAICA DOGWOOD (Piscidia Erythrina): Anodyne and Antispasmodic, with none of the disagreeable sequela of opium.

Fluid Extract KAVA KAVA (Piper Methysticum): An efficient remedy in specific and catarrhal affections of the genito-urinary tract.

Fluid Extract MANACA (Franciscea Uniflora): Introduced from Brazil, and highly esteemed as a Remedy in chronic rheumatism.

Fluid Extract RHUS AROMATICA: A Specific in enuresis and nocturnal incontinence of urine.

Fluid Extract SIERRA SALVIA (Artemisia Frigida): A Diuretic and nervous Stimulant, exciting the secretions in fever.

Fluid Extract USTILAGO MAIDIS (Corn Ergot): Held by many to be superior to Ergot of Rye, in that it causes intermittent instead of continuous contractions.

Fluid Extract WAHOO (Euonymus Atropurpureus): A direct hepatic Stimulant and Cathartic.

Fluid Extract WITCH HAZEL (Hamamelis Virginica): Tonic and Astringent, and exerting a peculiar action on the mucous membrane, which makes it very valuable in the treatment of hemorrhoids.

Fluid Extract YERBA SANTA (Eriodyction Californicum): An emulcent Alterative of high repute in affections of the bronchial mucous membrane.

Besides the above FLUID EXTRACTS, we beg to mention the following PREPARATIONS:—

Distilled Extract Witch Hazel (Hamamelis Virginica).
Concentrated Tincture Lippia Mexicana.
Desiccated Bullock's Blood (Sanguis Bovinus Exsiccatus). *See London Hospital Pharmacopœia.*
Desiccated Ox Gall (Fel Bovinum).
Concentration of Baptisin (Baptisia Tinctoria).
„ „ Barosmin (Barosma Crenata).
„ „ Euonymin, Brown (from the Bark of Root).
Concentration of Euonymin, Green (from the Bark of Shrub).
„ „ Irisin (Iris Versicolor).
„ „ Juglandin (Juglans Cinerea).
„ „ Leptandrin (Leptandra Virginica).
„ „ Podophyllin (Podophyllum Peltatum).
Lactated Pepsin.
Empty Capsules, for the Tasteless Administration of Nauseous Medicines.
Uterine Pencils of Iodoform.

SUGAR AND GELATINE COATED PILLS.

CASCARA CORDIAL.

We would solicit especial attention to this Preparation, which is an Elixir of the Bark of the Rhamnus Purshiana, a tree indigenous to the Pacific slope of North America, and already a recognised remedy of great value in the treatment of Chronic Constipation.

For Prices apply to Wholesale Depot:

BURGOYNE, BURBIDGES, CYRIAX & FARRIES, 16, Coleman St. London, E.C.

WRIGHT

DRUGS, CHEMICALS AND PHARMACEUTICAL PREPARATIONS

(Guaranteed to stand the Tests of the British Pharmacopœia).

50, SOUTHWARK STREET, LONDON,

EXPORT DRUGGISTS,

Manufacturing Pharmaceutical Chemists, Drug Grinders

IMPORTERS & DISTILLERS OF ESSENTIAL OILS.

W., L. & U., whose Laboratories are fitted with the most modern hydraulic distillatory and evaporating appliances are prepared to execute Indents for every description of

DRUGS AND CHEMICALS

OF THE FINEST QUALITY, AND

PHARMACEUTICAL PREPARATIONS

LAYMAN

Of Guaranteed Excellence

They are Manufacturers of

UMNEY'S FLUID EXTRACT of CINCHONA

The most Uniform, Elegant, and Powerful Preparation of Cinchona Bark ever introduced to the Profession.

(See Opinions of the Britith and Dutch Government Quinologists, the leading Scientific Chemists and Pharmacists of Great Britain and the United States, and the leading Journals of Pharmacy and Medicine.)

AND

SPECIAL PREPARATIONS:

Granular Effervescent Citrate Magnesia.
Granular Effervescent Preparations of all kinds.
Citrate of Iron and Ammonia,
Citrate of Iron and Quinia.
Citrate of Iron and Cinchonine.
Citrate of Iron and Cinchonidine.

Fluid Extracts.
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Pepsine, British Pharmacopœia.
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PHOTOGRAPHIC CHEMICALS.
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DRUGGISTS' SUNDRIES.
COD LIVER AND CASTOR OILS.

UMNEY

Prices Current of Drugs, Chemicals, Medicated Spirits, Chloroform, Ether, and Tinctures in bond sent upon application.

SPECIAL TERMS TO LARGE BUYERS.

50, SOUTHWARK STREET, LONDON, S.E.

BENGER'S PREPARATIONS
OF THE
NATURAL DIGESTIVE PRINCIPLES

These consist of exceedingly active Digestive Solutions, without disagreeable taste, prepared with special precautions to prevent decomposition or deterioration, and of artificially-digested and self-digestive foods prepared therefrom. They have been tested and reported on by the Editors of the leading Medical Journals, and are largely prescribed by eminent medical men.

"So many worthless articles of this kind have been sold, that great care is required in choosing those upon which reliance can be placed. Mr. Benger's care has, therefore, been well placed."—*Lancet*, Aug. 7, 1880.

"We have on a previous occasion noticed some of Mr. Benger's admirable preparations. Those now before us re not less satisfactory."—*Lancet*, March 25, 1882.

"Time and use have justified the claims put forward for these preparations."—*British Medical Journal*, April 1, 1882.

"The introduction of these preparations is a distinct advance in therapeutics."—*London Medical Record*, March 25, 1882.

1. Liquor Pancreaticus (Benger)
(REGISTERED).

An extract in which the digestive principles (proteolytic and amylolytic) of the pancreas exist in a state of great activity.

It is used—

(1).—For the preparation of peptonised or partially-digested foods, such as milk, soups, beef-tea, &c., the administration of which has been attended with such great success in the treatment of various diseases. *Simple directions for preparing these accompany each bottle.*

(2).—As an addition to various articles of invalids' diet, greatly assisting their digestion.

(3).—In doses of one or two teaspoonfuls, with a pinch of carbonate of soda, two or three hours after meals, to assist intestinal digestion.

(4).—As a most valuable addition to nutritive enemata.

In 4, 8, and 16 ounce Bottles, with Directions. Retail, 2s. 6d., 4s. 6d., and 8s. 6d.

2. Liquor Pepticus (Benger),

Containing the natural digestive principles of the stomach. An exceedingly active Fluid Pepsine. DOSE.—One or two teaspoonfuls in a little water, with meals.

"A digestive agent of extraordinary power."—Dr. W. ROBERTS, F.R.S., at Northwich meeting of British Medical Association.

In 4, 8, and 16 ounce Bottles. Retail, 3s., 5s. 6d., and 10s. 6d.

3. Benger's Peptonised Beef Jelly.

Taken by teaspoonfuls as a quick restorative, or used to fortify ordinary beef-tea, soups, &c., which it greatly enriches. This preparation contains much of the fibrin or flesh-forming element of the beef in a soluble and partly digested condition, and therefore vastly excels the various extracts and essences of beef. Tins, which are sealed and will keep in any climate, 2s. each.

"It is a most valuable form of concentrated food."—*Lancet*, March 25, 1882.

"We have found it invaluable for old people whose digestive powers are feeble, and also in convalesence from acute diseases."—*London Medical Record*, March 25, 1882.

4. Benger's Self-Digestive Food
(REGISTERED).

A delicious and highly nutritive aliment for infants and invalids. This Food is impregnated with the digestive principles of the pancreas; when mixed with warm milk these come at once into play, partially digesting the *whole* before it is eaten. In Liebig's Food the *farinaceous matter only* was acted on. In Benger's Food *both that and the albuminoids* are digested. It can be enjoyed and retained by delicate children and invalids when all other foods disagree.

Tins, 1s. 6d., 2s. 6d., and 5s.

"It is palatable and excellent in every way. It is taken readily both by adults and children. We have given it in very many cases with the most marked benefit, patients frequently retaining it after every other food had been rejected. For children who throw up their food in curdled masses it is invaluable."—*London Medical Record*, March 15, 1882.

The above Preparations have a very large and rapidly-increasing sale.

They may be obtained through Messrs. BARCLAY, EDWARDS, SUTTON, SANGER, *and other Wholesale Houses, or of the Manufacturers,*

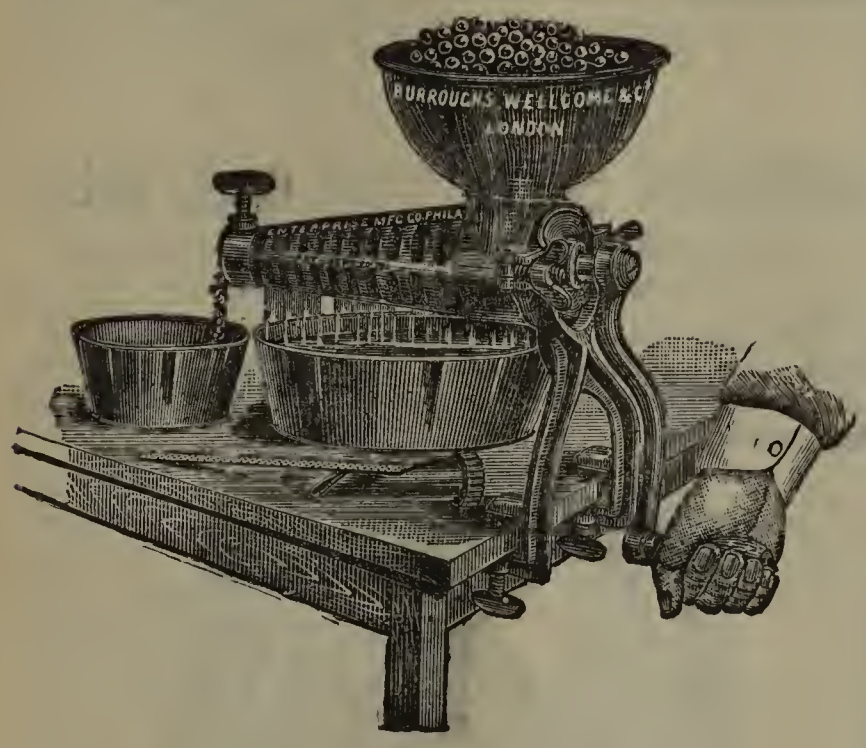
MOTTERSHEAD & CO. (S. PAINE & F. B. BENGER),
PHARMACEUTICAL CHEMISTS,
7, EXCHANGE STREET, MANCHESTER.

THE NEW

ENTERPRISE TINCTURE PRESS.

Specially adapted for Coarse and Fibrous Drugs.

The principle upon which this Press operates is, that the drug is acted upon in a continuous thin layer which is forced forward by each revolution of the screw into smaller and smaller space, the leverage yielding a force so powerful as to extract almost the entire moisture, delivering the residue of suitable drugs with almost crisp dryness, and, as experience has shown, it saves a greater amount of Tincture (very important in the case of Tincture of Opium and other expensive drugs) than even the most powerful Hydraulic Press. So thorough is its action in this respect that the *Chemists' Journal* has



humorously remarked of it that "it will almost squeeze blood out of a turnip." One firm informs us that they have saved at least £20 more in three months, by the use of this Press, than they could secure by using any other. The working of this Press being continuous, either small or very large quantities may be operated upon at one time, and much more rapidly than in any other form of apparatus.

The fact that drugs require handling but once, that the use of press cloths is done away with, and that the operation is continuous, shows a great advantage in this Press over any other.

CHARLES SYMES, Ph. D., says :—"This is an entirely new departure, inasmuch as in the ordinary press, either a lever or screw operates to *produce the pressure*, whereas in this ingenious arrangement the screw is itself the press. It has been used by our firm for pressing a variety of substances. For the marc of tincture of opium, orange peel, cardamoms, hops, squills, artichoke, lobelia, and such like substances, nothing better could be desired for the purpose. The continuous layer operated on is much thinner than in the ordinary press, and the force applied is uniform and considerable. When commencing to feed the press the regulating screw at the end should be turned well up, so as to leave the exit as widely open as possible. As soon as the refuse begins to pass through turn down the screw so as to reduce the size of the aperture, and recover the largest amount of tincture consistent with being able to work the handle with moderate exertion. It is here that experience and judgment come into play and determine the success of the operation."—(*Chemist & Druggist.*)

FURTHER REPORTS UPON

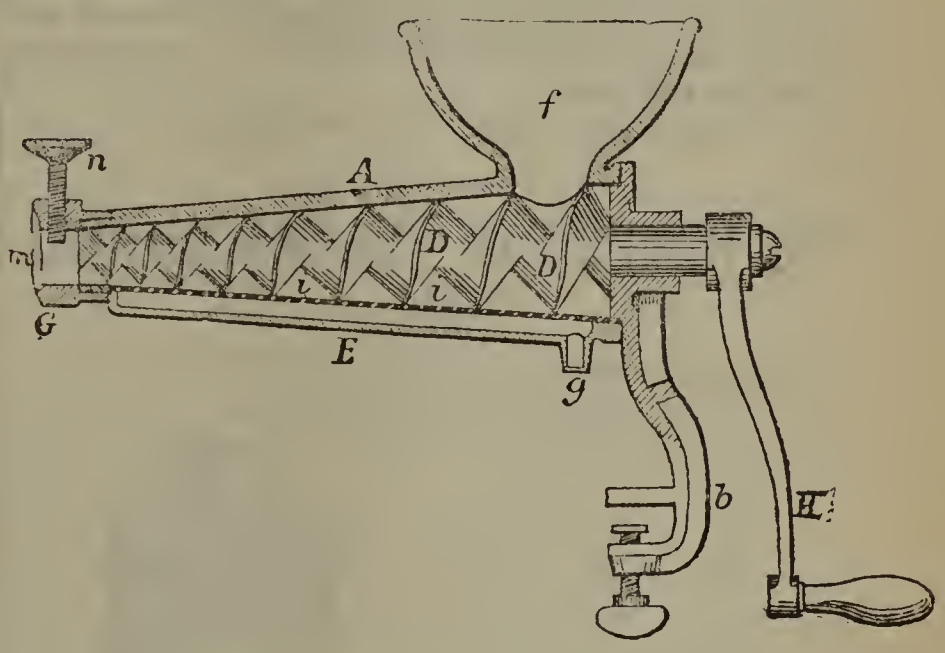
THE ENTERPRISE TINCTURE PRESS,

BY PROF. JOSEPH P. REMINGTON,

(*Of Philadelphia College of Pharmacy*).

"The Enterprise Manufacturing Company of Philapelphia have perfected a press for pharmaceutical purposes which bids fair to supplant most of the appliances which have been introduced from time to time. The particular advantages which are possessed by this press are, that the use of press cloths is entirely dispensed with, and all the vexations attending their use ; from its novel construction, the residue can be delivered uniformly dry, and thus the objection to most of the presses, which leave the residual cake comparatively dry on the surface, but with varying amounts of moisture in the interior, is avoided. Its great power, cheapness, compact form and adaptability to many wants of the druggist, are some of its principal recommendations."

It consists of a tapering cylinder (*A*), which has a hopper or bowl (*f*) with an outlet (*m*) and perforated plate (*i*), and a tapering auger-like screw (*D*) extending the full length which fits snugly, but so as to turn freely in the cylinder, well illustrated by the accompanying cuts.

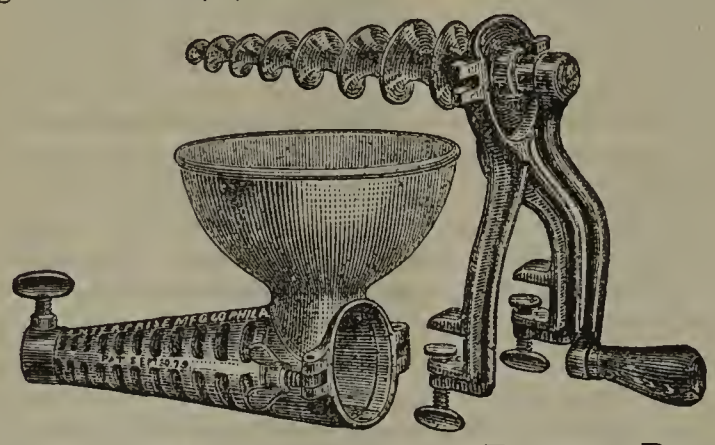


SECTION OF TINCTURE PRESS.

The metal composing the principal parts of the press is cast iron, well galvanized ; the tapering casing is secured at its largest end to a stand which has two legs furnished with clamps (*b*) for fastening it firmly to a table. On the under side of the casing is a hollow rib, within which is a chamber or channel for holding in position the perforated brass plates, of which there are several, with perforations of different degrees of fineness, to suit the various purposes to which the press is applied. These perforated brass plates are concave transversely, so as to form a continuation of the surface of the interior of the casing. The small end of the casing is provided with means whereby the outlet may be contracted or enlarged, and this consists of a brass screw (*n*), which on being turned in one direction diminishes the area of the outlet, or if turned in the opposite direction, the area is increased. This screw is adjusted in a detachable ring (*G*), which is screwed on the small end of the casing. The thread of the large tapering screw has a differential pitch, the pitch gradually decreasing from the large to the small end of the screw, thereby forming within the casing a spiral channel gradually decreasing in size.

The substance from which the liquid portion is to be separated is placed in the hopper, and the screw turned by using the handle (*H*) in such a direction that the thread will have a tendency to withdraw the substance from the hopper and force it through the tapering spiral channel formed by the screw within the casing, in doing

which the pressure on the substances will gradually increase as they approach the small end of the casing, the liquid matter thus forced from the materials meanwhile passing through the perforated plate (*i*) into the pan or receptacle below, whilst the residual matter passes off through the outlet (*m*).



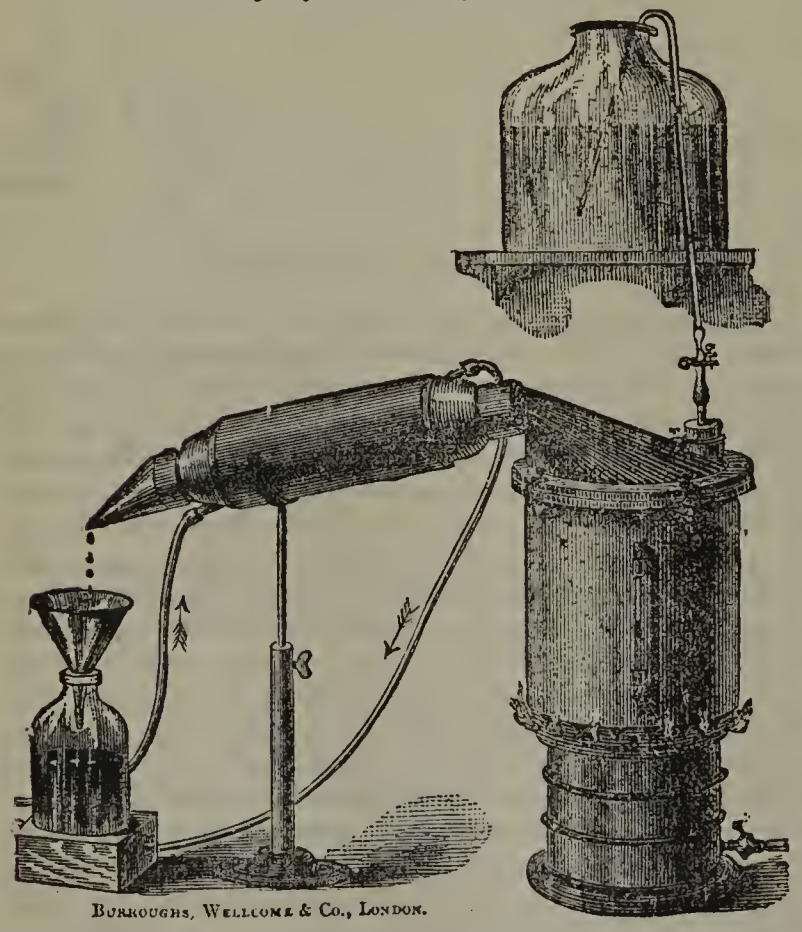
SPIRAL CHANNEL AND CASING OF TINCTURE PRESS.

The writer has used this press with great satisfaction in pressing juices from fruits, recovering alcohol and weak tinctures from percolation residues, and it is particularly useful with such drugs as arnica flowers, hops, &c., and those bulky, absorbent drugs that succeed so well in wasting alcohol. In expressing opium mass, in preparing aqueous extract of opium, it is very useful; the only class of drugs which cannot as yet be successfully treated are those in very fine powder or such as are of a very sticky or tenacious character.

Price 15/, subject to the usual discount.

THE REMINGTON PHARMACEUTICAL STILL.

(Invented by Professor J. P. Remington, Philadelphia College of Pharmacy, U.S.A.).



BURROUGHS, WELLCOME & CO., LONDON.

A great improvement over any previous device, by its greatly increased condensing power and rapidity of action, together with its simplicity, economy, and adaptability for general laboratory work.

Price in Tinned Copper, £7; in Nickel Plate, £9.

(Special Prices for larger Stills.)

The Still shown in the cut is the NEW FORM, the Still body holding over three gallons; the CONDENSER has seven straight tubes surrounded with the cold water presenting an enormous cooling surface, and thus securing most rapid condensation. The cold water is introduced by a rubber tube from a hydrant or bucket of water placed higher than the Still, and carried off as it becomes warmed by another tube as indicated by the arrows. BY THE SYPHON ARRANGEMENT SHOWN IN THE CUT, *it is possible to feed the Still from a reservoir, while distillation is in progress*; thus a three gallon Still may be used, where otherwise a much larger one would be necessary.

The Still may be set into a kettle partly filled with water, and thus used as a WATER BATH, or a shallow dish with flat rim, which accompanies the Still, may be placed between the two brass ring bands and clamped securely.

DIRECTIONS.—Charge the Still, and clamp on the top, after placing a moist piece of thick twine about 50 inches long between the brass rings; then connect the condenser, with the little outlet tube on the upper side and adjust as shown in the cut. Be careful to connect the rubber tube (which is joined to the faucet for the supply of cold water) with the lowest little tube, so that the COLD WATER ENTERS AT THE BOTTOM as indicated by the arrows.

We are the sole European Manufacturers.

THE

AMERICAN ENTERPRISE DRUG MILL.

Constructed on an Improved Principle. Cutters removable for Inspection or Cleaning.

This mill can be regulated to grind to any degree of fineness or coarseness required, and, by the mere turning of a thumb-screw, can be opened and the Cutters removed in a minute.

The form of the Cutters is designed so as to crush and reduce to powder almost any pulverizable substance, effectually and quickly, at the same time that the cutting edge is never destroyed, thus saving the expense of re-cutting, incident to the ordinary Mill.

The Cutters always keep their edge, and never require re-toothing; if broken they can be replaced at a trifling cost.

In this Mill ALONE there is no danger or loss resulting from grinding any number of different substances in succession, because, between each operation the Mill can be opened, the Cutters taken out, cleaned, and replaced with the greatest ease.

PROFESSOR MAISCH, Philadephia College of Pharmacy, U.S.A., says:—"The best Mill that has been devised. One of the prominent advantages is the facility with which the internal working parts can be viewed by simply turning one screw."

Report from an Eminent American Firm.

The most perfect and complete thing of its kind we have ever seen. We have tried almost all the Mills to be found in the market. Your Mill works to our entire satisfaction,

and we think will supply a want long felt by many Chemists and Druggists throughout the country. The great advantages this Mill possesses over all other Mills that we have seen or tried, are :—

1st. That it grinds fast and well, without requiring any more power than other Mills of its kind.

2nd. The whole interior can be exposed to view "in a few seconds," by turning a single screw and lifting the hopper, which works on a hinge, thus enabling the operator to examine the grinding plates when necessary.

3rd. When the Mill needs cleaning it can be taken entirely apart, "in less than a minute," by turning one screw, lifting the hopper over on its hinge, then taking out the shaft to which are attached the cutters, and you have them in a most convenient position to be cleaned.

4th. Having two wheels, the shaft is properly balanced, and the grinding surfaces are therefore running true with each other all the time.

5th. Its moderate cost.

Hoping you will make it generally known to the trade, that such a Mill can be had, we are sure that you can dispose of many of them.

Yours respectfully,
H. C. BLAIR & SONS,
Apothecaries, PHILADELPHIA

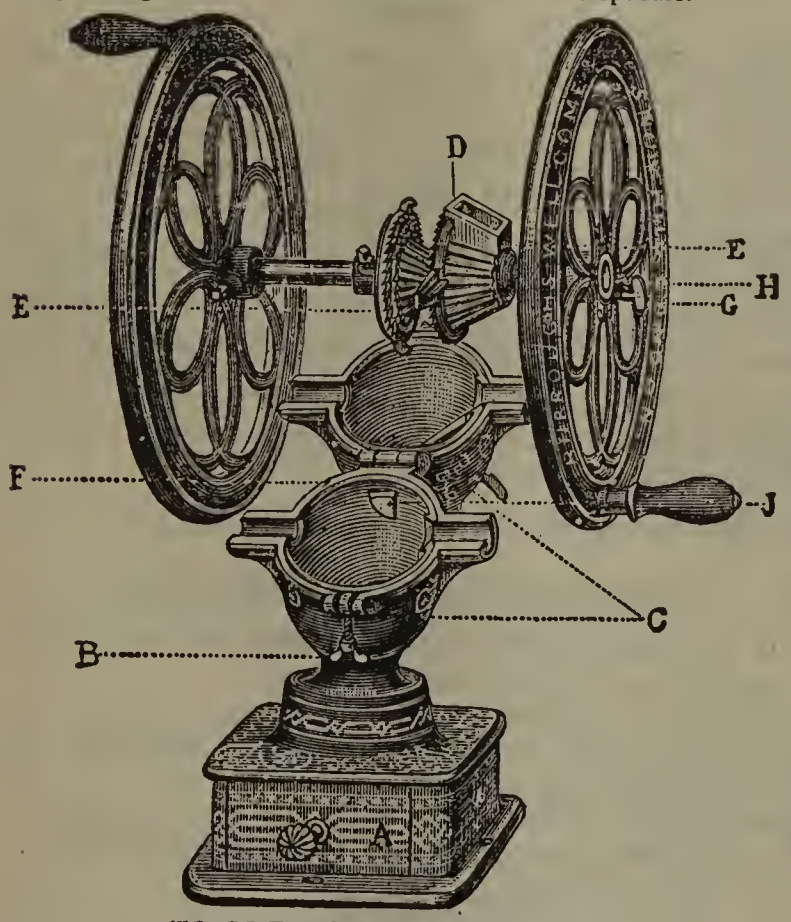
INSTRUCTIONS.

Fasten the Mill with screws to the Counter, or other suitable fixture, with the Drawer **A** facing the operator (as shown by the engraving below); see that the thumbscrew **B** which fastens the body **C** together is down close. If these two parts (or body) do not fix together easily, the loose grinder **D** is not in its proper position; this is sometimes caused by loose substances falling on the two raised bearers **J** (inside the bottom part of body **C**), which bearers are formed to receive the projection **E E**, forming part of the loose grinder **D**, or it may be the result of similar substances being allowed to remain on the top edge of **F** of the half body. The above instructions being carried out, the operator will now place a handful of material intended to be ground into the hopper, and give half-a-dozen turns.

IF TOO COARSE, unscrew the thumbscrew **G** free from collar **H**, and turn the collar **FROM** the operator; then screw the thumbscrew **G** into the hole in the side of the collar **H**.

IF TOO FINE, unscrew the thumbscrew **G** free from collar **H**, and turn the collar **TOWARDS** the operator; then screw the thumbscrew **G** into the hole in the side of the collar **H**.

All parts marked **X** must be fixed on the right-hand side of the Mill. The position of the flywheels upon the spindle is shown by corresponding marks on the wheel and end of the spindle.



TO CLEAN THE GRINDERS.

Unfasten the thumbscrew **B** on the body of Mill, then lift the upper part and let it go gently back, take hold of the two wheels and lift up; by these means the grinders will be released, and may be cleaned at pleasure.

NAILS, &c.—If a nail should find its way into the Mill, it should be taken out instantly; this may be done by the same process as required for cleaning the grinders. (See instructions above.)

In case of breakage, new cutters can be had at a small charge by quoting the number stamped on the flange of the fixed grinder.

Three sizes.—£2. £3. £5. Plain.
£2 10s. £3 10s. £5 10s. Ornamented.
Usual Discount.

THE BURROUGHS INHALER

"Is an ingenious and convenient device for inhaling chloride of ammonium fumes; by its use the chloride of ammonium is brought

in more intimate contact with the mucous surfaces of the passage of the nose and throat than by any other form of inhaler."—*The Medical Press and Circular* Reports.

For full Notes and Reports see front pages of *The Lancet* May 6th.

THE PORTABILITY OF DRUGS IN FIELD SERVICE.

To the Editor of THE LANCET.

SIR,—I have just read a letter in *The Lancet* from Surgeon-Major Evatt, A.M.D., and fully endorse everything he says as to the absolute necessity of reducing the bulk of drugs in field service. I have not unfrequently at such times been without medicines owing to the delay and difficulty of carriage. Since my retirement from the service I have been engaged in private practice, and now frequently prescribe (being more palatable than medicines as generally dispensed) McKesson and Robbins' concentrated preparations of the various alkaloids and other drugs of the Pharmacopœia, put up in ovoid capsuled pills; also the Wyeth's compressed lenticular tablets of such chemical salts as chlorate of potash, muriate of ammonia, bicarbonate of soda, &c. Almost, if not all, medicines can be obtained in this concentrated form; and, what is very important, they are easily soluble, being covered with transparent gelatine, which seals and protects the drugs from oxidation or other changes, and renders them, I believe, impervious to climatic influences; the pills being ovoid-shaped are more easily swallowed than the old round pill. I most strongly recommend the said preparations to the notice of the military medical authorities; they will, I think, be found to meet exactly the requirements so clearly pointed out by Surgeon-Major Evatt, and solve the problem of reducing the bulk and rendering drugs easily portable. I think I may safely estimate that a pair of ordinary sized saddle-bags would contain a fully equipped dispensary, sufficient to meet the medical requirements of a thousand men for a three months' campaign—even including anæsthetics, to be carried in metallic flasks, fitted with close-fitting screwed tops, instead of the glass bottles at present in use.

I am, Sir, yours, &c.,
G. P. M. WOODWARD, M.D., F.R.C.S.I.,
Herne Hill. Deputy Surgeon-General (retired).

REMARKABLE TESTS.

The interesting voyage round the world of the steam yacht "Ceylon" last year has given another opportunity of further establishing the remarkable imperishable character of the McK. & R. Capsuled Pills. This yacht occupied about twelve months on her journey, passing through all the most severe and destructible climates, yet these pills thoroughly resisted, not only the excessive moisture, but the trying equatorial heats, whilst, as will be seen from the following report furnished by W. R. H. Stewart, Esq., M.D., F.R.C.S., L.R.C.P.E., &c., who accompanied the yacht as medical officer, the other kinds of pills carried on board softened and adhered together, and were thus rendered entirely useless.

16, Harley St., London, W., Feb. 1, 1883.

I have much pleasure in reporting upon the excellent qualities of the drugs supplied by Messrs. BURROUGHS & WELLCOME, especially with regard to the McK. & R. Capsuled Pills, a large number of which were used on board the s.s. "Ceylon" during her cruise round the world. Whilst other kinds of pills which we carried softened and adhered together, these, when kept in well corked bottles, retained their efficiency and consistency during the various and trying changes of temperature and climate through which we passed. I strongly recommend them to the notice of medical men practising abroad, and also to the owners and managers of the various lines of ocean-going steamers sailing in hot latitudes.

WM. R. H. STEWART, F.R.C.S., L.R.C.P.E., &c., &c.,
Surgeon to the s.s. "Ceylon" during her cruise round the world; Surgeon to the North-West London Hospital, and Surgeon in Charge of the Throat and Ear Department at the Hospital, &c.

The following is an extract from a letter which we have received from Captains Norman and Thomas, who crossed and re-crossed the Atlantic in the "Little Western," a sail boat only sixteen feet long, the smallest craft that has ever crossed the ocean:—

"Little Western," New York, Oct. 7th.

Messrs. BURROUGHS, WELLCOME & Co.

Gentlemen,—The McK. & R. Capsuled Quinine Pills, which we procured from you just before we sailed from London, have stood a most wonderful test. Our return voyage across the Atlantic occupied over one hundred days, and we experienced heavy weather most of the time, the "Little Western" being almost constantly under water. Nearly all our stores of a perishable nature quickly spoiled, except such of our provisions as we had in sealed tins, and the McK. & R. Quinine Pills in bottles. These Pills do not show the slightest change, while in our medicine chest, alongside them, were some sugar or chalk-coated pills that became one solid mass resembling dirty tallow.

The McK. & R. Pills must be of great value for ships making long voyages, for ordinary drugs so often lose their powers by exposure and age.

Yours very respectfully,
FRED. NORMAN, } Commanders.
GEO. T. THOMAS, }

KEPLER COD-LIVER OIL WITH EXTRACT OF MALT.

This is an emulsified combination of the purest fresh Norwegian Cod Liver Oil with 50 per cent. of Extract of Malt (Kepler).

So combined, the oil is sub-divided into minute particles which can be seen under the microscope to be as fine as the granules of milk; and so much finer than any that can be obtained by any emulsion with gums. On the fineness of the emulsion depends the digestibility of the oil. "The digestive change undergone by fatty matters in the small intestine consists mainly in their reduction into a state of emulsion, or division into infinitely minute particles."

For full Notes and Reports see front pages of *The Lancet*, May 6th.

THE BURROUGHS BEEF AND IRON WINE.

"This is a really valuable preparation, and, as far as we know, a novelty. It contains beef-juice and citrate of iron in solution in wine, and is therefore a very powerful and rapidly-acting atonic Children, as well as adults, take it easily; and, as its taste is by no means unpleasant, it can hardly fail to attain great popularity. In many cases of scrofula and rickets we have given it with the most gratifying results."—*The Lancet* Report.

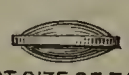
For full Notes and Reports see front pages of *The Lancet*, May 6th.

LAWTON'S ABSORBENT COTTON

"Has been pronounced by some of our most eminent surgeons the very best absorbent for taking up discharges; it is very fine and soft, and acts instantly."—*The Medical Press and Circular.*

For full Notes and Reports see front pages of *The Lancet*, May 6th.

THE WYETH COMPRESSED TABLETS



EXACT SIZE OF TABLET.

"Are a great improvement on the hard, unpalatable lozenges which have so long done duty in the Pharmacopœia. The Chlorate of Potash and Chlorate of Potash and Borax will be found useful in throat affections, whilst the Bicarbonate of Potash and Bicarbonate of Soda Tablets will prove efficacious in dyspepsia. The Soda Mint, or Neutralising Tablets, will earn the gratitude of many a flatulent dyspeptic."—*The Lancet.*

For full Notes and Reports see front pages of *The Lancet*, May 6th.

HAZELINE.

The Medical Press and Circular reports:—"Hazeline is a valuable astringent remedy, wonderfully efficacious in checking *internal* or *external hæmorrhages*, and for *allaying inflammation*. It is particularly valuable in the treatment of *bleeding piles*, and as a *surgical dressing* it deserves attention."

For full Notes and Reports see front pages of *The Lancet*, May 6th.

THE WYETH SOLUBLE COMPRESSED HYPODERMIC TABLETS.

The following formulæ and combinations embrace all those in general request. Others will be added as the demands of the profession warrant.

We claim for the Wyeth Hypodermic Tablets:

Absolute Accuracy of Dose.
Ready and Entire Solubility.
Perfect Preservation of the Drug.

Their convenience and utility will at once be apparent on examination.

Morphiæ Sulphas ....1-3 grain.	Morphiæ Sulphas ....1-8 grain.
Morphiæ Sulphas ....1-4 grain.	Atropiæ Sulphas .... 1-200 grain.
Morphiæ Sulphas ....1-6 grain.	Morphiæ Sulphas ....1-12 grain.
Morphiæ Sulphas ....1-8 grain.	Atropiæ Sulphas ....1-250 grain.
Morphiæ Sulphas ....1-12 grain.	Atropiæ Sulphas ....1-60 grain.
Morphiæ Sulphas ....1-3 grain.	Atropiæ Sulphas ....1-100 grain.
Atropiæ Sulphas ....1-120 grain.	Atropiæ Sulphas ....1-150 grain.
Morphiæ Sulphas ....1-4 grain.	Strychniæ Sulphas ..1-60 grain.
Atropiæ Sulphas ....1-150 grain.	Strychniæ Sulphas ..1-100 grain.
Morphiæ Sulphas ....1-6 grain.	Strychniæ Sulphas ..1-150 grain.
Atropiæ Sulphas ....1-180 grain.	

For full Notes and Reports see front pages of *The Lancet*, May 6th.

THE WYETH DIALYSED IRON.

1. It is easily administered, the dose being very small.
2. It has no unpleasant taste or smell.
3. It does not irritate the stomach.
4. It has no effect on the bowels, producing neither constipation nor diarrhœa.
5. It does not blacken the teeth.

In ordering please specify Fer. Wyeth 3 oz. with Dropper.

NOTE.

All the articles mentioned on these pages may be obtained from respectable Dispensing Chemists and Wholesale Druggists in every part of the world, or from the European Depôt of Burroughs, Wellcome & Co., Snow Hill, London, E.C.

THE VERDICT.

THE LANCET reports of the Kepler Extract of Malt: "*The best known*, and *in this country the largest used Extract of Malt.* It is as distinct an advance in therapeutics as was the introduction of cod-liver oil. It is one of our best remedies for atonic dyspepsia, and is undoubtedly useful in consumption and other wasting diseases."

Professor Yandall, M.D., of Louisville, U.S.A., reports of it:—"The Kepler Extract of Malt is the best, and has the finest flavour of any I have seen; it is a very valuable preparation."

"The Medical Times and Gazette," says of it:—"The Kepler Extract of Malt is deserving special commendation. It is, we venture to say, by far the best we have seen. *The one most widely known and most largely used in this country.*"

"The Medical Press and Circular" in reporting upon the subject says:—"The Kepler Extract of Malt is reliable, and is manufactured in such a careful manner as to ensure the preservation of its valuable constituents. It is very delicious to the taste, and has been found by analysis to be exceedingly rich in diastase, and consequently is a valuable digestive agent.

The Kepler Malt, combined with Cod Liver Oil, is the most palatable and easily digested of any form we have yet seen for administering Cod Liver Oil."

Burroughs, Wellcome & Co., Manufacturing Chemists, 7, Snow Hill, London, E.C.

No Stable is complete without

ELLIMAN'S ROYAL EMBROCATION

For Sprains of all kinds, Curbs, and Splints.
For Over-reaches, Chapped Heels, Wind Galls.
For Rheumatism in Horses.
For Sore Throats and Influenza.

For Broken Knees, Bruises, Capped Hocks.
For Sore Shoulders, Sore Backs.
For Foot Rot, and Sore Mouths in Sheep and Lambs.

ELLIMAN'S ROYAL EMBROCATION, FOR HORSES AND CATTLE.

Introduced to the public 30 years since, has maintained its world-wide reputation, not only by reason of its possessing remarkable healing properties, quickly restoring an injured limb or part to a healthy state, but also on account of the ease with which it is applied, its use being unattended by the slightest risk of blemish. A large proportion of the Masters of the Foxhounds and Harriers throughout the United Kingdom use it constantly in their Stables. The testimony of these men as to its efficacy all must recognise as unimpeachable. The Embrocation is very generally used by Contractors, Builders, Farmers, Brewers, Colliery Owners, Livery Stable Keepers, and owners of Carriage and Draught Horses, in fact, by all those who see that it is the strictest economy to keep their *horses' legs sound* and fit for *hard work*.

SPECIMEN TESTIMONIALS.

From His Grace the Duke of Rutland, Master of Belvoir Hunt.

December 1st, 1879.

SIRS,—Elliman's Royal Embrocation is used in my stables; I think it very useful. RUTLAND.

From the Royal Hunt, Windsor Great Park.

Cumberland Lodge, July 4th, 1851.

SIRS,—I feel great pleasure in testifying to the successful application of your Embrocation for green wounds, the removal of strains and enlargement of Horses' legs, &c.

Yours truly, CHARLES BRYANT.

From Lieut.-Col. R. H. Price, Master of Radnorshire Hunt.

December, 1878.

GENTLEMEN,—I use the Royal Embrocation in the stables and kennels, and have found it very serviceable. I have also used the Universal Embrocation for Lumbago and Rheumatism for the last two years, and have suffered very little since using it. R. H. PRICE, Lieut.-Col.

From Major J. M. Browne, Master of South Staffordshire Hounds.

October 17th, 1879.

SIRS,—I find Elliman's Embrocation exceedingly good for sprains and cuts in horses, and also for cuts in hounds' feet. I shall strongly recommend it to all my friends.

Yours faithfully, J. M. BROWNE.

From Glass Houghton Collieries, near Castleford.

November 22nd, 1880.

DEAR SIR,—Enclosed please find an order for 12 dozen 3s. 6d. size Royal Embrocation for horses as before, which kindly send off at your convenience, to our Colliery sidings, near Pontefract. J. D. THORP'S EXORS.

From J. Bellamy, Esq., Master of the Isle of Wight Hunt. December, 1878.

SIRS,—I use Elliman's Royal Embrocation, and have found it most efficacious in many cases of sprains and wounds, but especially for sore throats, and when used with a bandage as a mild blister. J. BELLAMY.

Sold by Chemists, in Bottles, 2s., 2s. 6d., and 3s. 6d. Prepared by ELLIMAN, SONS & CO., SLOUGH.

RHEUMATISM, SPRAINS, CHEST COLDS, &c.

ELLIMAN'S UNIVERSAL EMBROCATION.

Often wanted in the Household. It is a certain cure. Simple in application. Sold everywhere.

ELLIMAN'S UNIVERSAL EMBROCATION

For Sore Throats and Colds at the Chest.
For Rheumatism and Lumbago.
For Strains, Sprains, and Bruises.
For Chaps and Chilblains before broken.

To replace the Mustard Plaster.

Sold by all Chemists, in Bottles, 1s. 1½d. and 2s. 9d. Prepared by ELLIMAN, SONS & CO., SLOUGH.

"THE MONTH."

Welcome signs of spring are already meeting the eye. The upper branches of the elm are bristling with flowerbuds, the coltsfoot is decking favourite localities with its bright blossoms, and the catkins of the black poplar, the hazel and the willow are beginning to show traces of colour. An Isle of Wight correspondent remarks that compared with last year the flowers are running a neck-and-neck race. *Pulmonaria angustifolia* was observed in flower on February 7, and the Lent lily, true to its name, opened one day before Lent began. In the Royal Gardens, at Kew, the nutmeg is just coming into blossom.

In *Nature* (February 15, p. 365), Fritz Muller calls attention to some interesting facts with regard to plants which have differently coloured anthers or pollen in the same flower, or stamens of different length. Thus in *Heteranthera reniformis* insects visit the short stamens with yellow anthers, while fertilization is effected by the longer stamen with pale blue pollen. He suggests that the green colour of the anthers of the longer stamens of the mid-styled and shorter-styled flowers of *Lythrum Salicaria* may protect them against the attacks of pollen-eating insects. In a species of *Cassia* he has noticed that the humble bees which visit it gather the pollen of the four intermediate stamens, the three upper ones being pollenless, while the three lower ones, which are very long and curved, deposit their pollen on the back of the insects, whence it is taken by the similarly curved and elongated style.

At a meeting of the Linnean Society, January 20, Mr. H. Groves exhibited a specimen of *Ranunculus ophioglossifolius*, collected in the New Forest. In the British Islands this species has hitherto been found only in Jersey, and even there it is now practically extinct. The discovery of this plant and of *Eriophorum gracile*, *Orchis incarnata*, L., and of new localities for *Spiranthes æstivalis* and *Isnardia palustris*, indicate that there are probably parts of the grand old forest which may still repay careful exploration. A new British *Potamogeton* is also reported from North Wales, an account of which will appear in the March number of the *Journal of Botany*.

It is fortunate that fungological forays do not depend for their success on the edible properties of the species met with. One by one our edible species have been recently attacked. M. Dupetit has stated that *Agaricus campestris*, *Boletus edulis*, and three species of *Amanita* contain a poison, and now fresh *Helvella esculenta* is stated by Dr. Bostroem, of Freiburg (*Brit. Med. Journ.*, Jan. 27, p. 172), to also contain under all conditions a very active poison. Boiling and rejection of the water afterwards, prolonged washing, the addition of salt and any pickling process all fail to eliminate it. The fact, however, that this and other fungi have long been eaten with impunity, taken in conjunction with Bostroem's statement that the active principle is very soluble in hot water and is very unstable, and his denial that there is any form of the fungus but the typical one, as well as his affirmation that that one is poisonous, leads to the suspicion that it is probably only in cases of idiosyncrasy, or when the fungus is eaten raw, that there is any danger. *Lycoperdon giganteum* has been known to produce poisonous symptoms when eaten raw, but it is harmless and agreeable to eat when cooked.

The importance of a knowledge of the properties of the microscopic fungi with which we are surrounded is daily shown to be more and more important. A disease occasionally met with in France and occurring (*Lancet*, Jan. 27, p. 160), chiefly among labourers who manipulate the stems of the large reed, *Arundo Donax*, has recently been traced to the fungus *Sporotrichum dermatodes*, developed on the surface of the reeds under the influence of prolonged exposure to moisture. The symptoms produced are a painful irritation of the nose, eyes and throat, followed by erythematous swelling, which extends to others parts of the body. Acuminated pustules subsequently appear; inflammation of the eyes and a slight cough being also produced. Although usually trifling, the malady may sometimes assume a severe form, and has been known to cause death.

The *Brewers' Guardian* (Feb. 13, p. 47), calls attention to the fact that notwithstanding there was probably nearly 300,000 tons of dry yeast produced in the breweries of this country last year, six-sevenths of which was in excess of the requirements of the breweries, the imports of dried yeast from abroad during the same period amounted to nearly 30,000 tons. It is known that the bitterness of brewer's yeast is an obstacle in the way of its utilization by bakers, for whom the specially-prepared yeast is imported from abroad; but it would seem desirable that further investigation should be made as to the possibility of removing the objectionable bitterness and so to make another waste product available for economic purposes.

A few months since it was demonstrated by M. Gessard (*Pharm. Journ.*, [3], xii., 802) that the blue-green coloration sometimes noticed on the dressings of wounds is due to the development of minute organisms capable of separate cultivation. M. Rapin has now found that the analogous phenomenon of a black coloration occasionally occurring in toilet sponges is referable to a similar cause (*Lancet*, Feb. 17, p. 325). The blackness is attributed to the development of a minute fungus belonging to the genus *Torula*, and which he has named *T. spongicola*, in the chitinous fibres of the sponge, where it produces black spores and induces an alteration in the tissue of the sponge itself, which also becomes black. The fungus is communicable from one sponge to another; but it can be combated with the ordinary disinfectants or boiling water.

M. A. Bechamp, in the first number of Brown-Séquard's *Archives de Physiologie* for the present year (*Lancet*, January 27, p. 163), undertakes to show that the power possessed by the saliva of man of converting starch into sugar, which is not exerted by the saliva of the horse, dog or ox, is dependent upon a peculiar and special zymase which is the outcome of the action of microzymes peculiar to the salivary glands, of the microzymes of the anatomical elements which line the buccal cavity and the tongue, and of the microzymes and infusorial animalcules that accumulate in the interstices of the teeth. He found in the course of his experiment that a milligramme of the matter adherent to the free border of the gums of a healthy man, after being frequently washed with a weak solution of creasote, acted powerfully on starch paste. The parotidean saliva of the horse and dog do not saccharify boiled starch naturally, but acquire the power if placed in contact with the buccal organism of man.

Dr. C. Burger, of Bonn, describes in the *Berl.*

Med. Woch., No. 1, 1883 (*Med. Times and Gazette*, Feb. 3, p. 129), the bacterium of whooping cough. They are found most abundantly in the opaque white pellets of the early stage of the disease. With a magnifying power of 600 diameters the bacilli appear as small rods of different sizes, but of an attenuated ellipsoidal shape, the smaller being about twice as long as broad. With the aid of higher magnifying power and an Abbé condensing lens the larger rods are seen to have a constriction in the middle. These are quite distinct from those of *Leptothrix buccalis*, which are longer and thicker, and the spores and long threads of the leptothrix may always be discovered in close contiguity with them. Methyl-violet or fuchsin is used as the staining agent.

M. Vallin has lately (*Lancet*, Jan. 27, p. 161) communicated to the Académie de Médecine the results of a series of experiments on the disinfection of tubercle. He found that it was necessary in order to destroy the activity of tuberculous matter, spread on strips of paper in a chamber 50 cubic centimetres in area, to expose them to the fumes of burning sulphur for twenty-four hours, and that if less than 20 grams of sulphur was burnt animals subsequently inoculated with the matter died of tuberculous disease. He therefore deduces from his experiments the inference that it would be well every year to purify by sulphurous fumigation all prisons, barracks, hospitals and schools.

A paper, by Dr. Leistikow, is reported in the *Berliner Woch.*, No. 32, detailing the results of his researches on the bacterium of gonorrhœa. These are found in the pus cells, the locality distinguishing them from other bacteria, and whether found in the urethra or conjunctiva may be taken as proof of the disease, since they are not found in other secretions. Corrosive sublimate prevents their development, and Dr. Leistikow especially recommends its external use, in an exceedingly weak solution, such as 1 in 2000 or 3000, as the best treatment of gonorrhœa.

A novel dress, intended to protect nurses and others who have to enter the apartments of persons suffering from infectious disease, has recently been exhibited (*Med. Times and Gazette*, Jan. 27, p. 97) at the rooms of the National Health Society, Berners Street. The garment is of mackintosh, glazed inside and out, and made to completely envelop the wearer, with a hood to cover the head, only the hands and face remaining exposed. The garment is enclosed in a tight case when not in use, and can be cleansed by disinfectants as often as deemed necessary. By this means the danger of communicating diseases by garments is minimized. Further protection is given where necessary by a simple form of respirator, made of two folds of thin washing-net, between which is placed a thin layer of medicated cotton wool, which allows no germs to pass, while permitting the wearer to breathe. After use the wool is burnt and the net washed.

An account of the action of very dilute nitro-hydrochloric acid on meat and other animal substances has been recently published by Signor Pavesi, in the *Giorn. Farm. Chim.*, xxxi., 529 (*Nature*, February 8, p. 348). He finds that it is an excellent preserving agent. Meat in pieces of about 1 kilogramme kept in the liquid in wooden vessels remains unaltered and savoury for years. The meat so treated may also be dried at 15° to 20° C. without undergoing change, apart from a diminution of volume and the appearance of a brown colour; when placed for a few hours in water the meat regains its original softness and colour.

Professor Dianin records some observations on the use of trichlorophenol as a disinfectant, in the *St. Petersburg Med. Woch.*, 38, 1882 (*Practitioner*, Feb., p. 146). He considers it twenty-five times more powerful than carbolic acid, and that it deodorizes as well as disinfects. The solid substance is but very slightly, the solution not at all, irritating to the tissues. It is prepared by acting on carbolic acid with chloride of lime and the formula given is $C_6H_2Cl_3OH$. The compound with calcium is cheaper than carbolic acid, and that with sodium is inodorous, the properties of both being similar to those of trichlorophenol.

Dr. Gourges (*Jour. de Med. de Paris*, Sept. 22) recommends an ointment of 4 parts of finely powdered boracic acid, ½ part of benzoic acid and 20 parts of vaselin, in the treatment of boils. It promptly relieves pain, and causes the disappearance of the boil in three or four days.

L'Union Pharmaceutique proposes a method of applying chrysarobin to the skin, by which the staining of the clothes usually caused by it may be prevented. The chrysarobin is mixed with water so as to form a dough, and is applied carefully to the diseased spot, previously freed by warm water from adhering scales. As soon as it is dry, which will be in a few minutes, it is covered with a layer of collodion. After some days the whole may be soaked and washed off with warm water, when the application may be repeated (*New Remedies*, Jan., p. 20).

Iodide of barium has been used in France as an application to enlarged lymphatic glands, and more especially as a local application in chronic eczema. For this purpose it can be mixed with petrolatum. Iodide of barium is actively poisonous (*New Remedies*, Jan., p. 20).

Iodide of lithium is said to be the most useful of the lithium salts in the treatment of gout. It is serviceable in well developed cases and also in varieties of eczema and dyspepsia of gouty origin (*New Remedies*, Jan., p. 20).

Dr. W. H. Broadbent, commenting in the *Lancet* (Jan. 27, p. 166) on the use of manganese in amenorrhœa, points out that the use of the metal for this purpose was known as long ago as 1868, and quotes from the 'Transactions of the Clinical Society' (ii., 122) to show that it is there stated that in using certain metals as accessories to iron, manganese seemed to have a special influence in promoting the return of the catamenia, and nickel a special property in checking leucorrhœa. He attributes, however, the favourable effect of manganese to its effect on the general health and on the blood, since it does good in anæmia, whether associated with amenorrhœa or menorrhagia.

Dr. J. Mortimer Granville, in the *Brit. Med. Journ.*, p. 183, gives a prescription for acute gout, which he believes will give great relief. It is as follows:—"Ammonii chloridi, ℥ij.; potassæ chloratis, ℥jss.; tincturæ iodi, ℥j.; glycerini, ℥vj.; aquam destillatam ad ℥vj. Misce fiat mistura cujus sumantur cochlearia duo magna quartâ (vel tertiâ) quaque hora. If there be much thirst it is well to give the dose of this mixture further diluted with water. In the interval of successive attacks of gout while the *malaise* lasts, great benefit is often derived from the

use of a single dose freely diluted every morning before breakfast." If this prescription were correct, it would certainly be a heroic remedy, and one impossible to dispense as directed. But there can be no no doubt that ℥vj., as applied to distilled water, is a printer's error, probably for ℨvj.; at all events, chemists who may be called upon to dispense this prescription had better make inquiries on this point.

Dr. Quinlan, of Dublin, who last year read a paper at the British Pharmaceutical Conference, on the hæmostatic properties of the *Plantago lanceolata*, has recently investigated the properties of the common mullein, *Verbascum Thapsus* (*British Medical Journal*, January 27, p. 149). This plant has long been used in Ireland as a domestic remedy for consumptive cough, and Dr. Quinlan has made a series of experiments with a view to determine if it really possesses the valuable properties attributed to it. He finds that when boiled in milk the patient takes the decoction readily and experiences a physiological want when it is omitted. Its power of checking phthisical looseness of the bowels and the relief afforded to coughing were very marked, so that the patients took hardly any other cough mixture. In early stages it appears to have a distinct power of increasing weight, but in advanced cases, Dr. Quinlan remarks that he is not aware of anything that will do this except koumiss.

Dr. T. P. Kinnicutt has tried the oil of wintergreen, salicylate of methyl, in twelve cases of acute rheumatism, and considers that it possesses the following advantages (*Brit. Med. Journ.*, February 10, p. 243). Its use is unattended with the occasional toxic effects and frequent gastric disturbance produced by the acid or its sodium salt, while its agreeable taste and its comparative cheapness are also recommendations in favour of its employment. In controlling the disease, he considers that it at least ranks with any of the salicyl compounds, and that the best method of administration is in frequently repeated doses, diminished throughout the period of convalescence.

Paraldehyd has recently been introduced into medical practice as a new hypnotic, by Professor Morselli, of Turin (*Brit. Med. Journ.*, Feb. 3, p. 215). This body is a polymeric form of aldehyde and in its physiological action somewhat resembles chloral. Its formula is $C_6H_{12}O_3$. From chloral it differs in strengthening the action of the heart while diminishing its frequency. It also greatly increases the flow of urine, but does not affect the skin, and it does not give rise to digestive disturbance, headache or any other unpleasant symptom. Professor Morselli believes that it will to a large extent take the place of chloral. He has found it a valuable remedy in mania, melancholy and other nervous affections, as well as in the sleeplessness that accompanies acute bronchial catarrh, lobar pneumonia and heart disease. The action of paraldehyd was first studied by Dr. Cervello, of Palermo.

Dr. W. Soper, in the *Lancet* (Feb. 10, p. 262), recommends the use of a mixture of equal parts of glycerine and castor oil, slightly flavoured with oil of almonds or lemon, as an agreeable substitute for castor oil. He states that of this mixture a teaspoonful is an effective dose, and in cases of chronic constipation, hæmorrhoids and anæmia it has proved most useful. He has found half-teaspoonful doses useful in the early states of bronchitis, in which it seems to promote exudation from the bronchial tubes and is certainly expectorant. Dr. Soper having stated that there was some difficulty in making the two liquids mix, Mr. Brewis, a Portsmouth chemist, in the succeeding number (Feb. 10, p. 303), points out that if the glycerine be first poured into a mortar and the castor oil added very gradually, triturating thoroughly meanwhile, the result will be a perfectly homogeneous jelly-like emulsion, which, even after the lapse of twenty-four hours, shows no signs of separation, and in which the taste of the oil, if the finest Italian kind be used, is quite disguised.

M. Vigier, in the *Gaz. Hebd. de Méd.* (*Med. Press and Circ.*, Feb. 4, p. 149), states that any substance incorporated with glycerine is not absorbed when applied to the skin and does not produce constitutional effects. Hence he recommends the use of glycerine instead of lard in mercurial preparations for scabies, pediculi, etc. He states that even the following glycerite may be used without danger:—Hydrarg. bichlor. ℥iss., glycerine ℨiij.

Thanks to careful observations by scientific observers, the use of medicines is daily becoming less empirical and more dependent on actual knowledge based on experiments on animals. Professor Rossbach, of Wurtzburg, has recently added to our already increasing store, by experiments made as to the action of alkalies and other expectorants (*Brit. Med. Journ.*, Jan. 27, p. 165). It has generally been supposed that alkalies render the mucus of the air passages, etc., more soluble. Dr. Rossbach's observations, however, show that this is not the case, but that they cause a gradually increasing pallor and greenish-white appearance of the mucous membrane and ultimately a complete cessation of the mucous secretion.

As the results of other experiments, Dr. Rossbach strongly recommends oil of turpentine internally and locally in cases of chronic bronchial catarrh, especially where putrid expectoration is present. Apomorphia he considers to be the prototype of all expectorants, it giving in his hands most excellent results. He administers it in the form of hydrochlorate in doses of $\frac{1}{15}$ to $\frac{1}{7}$ of a grain thrice daily with a little dilute hydrochloric acid, the mixture containing no sugar and being kept in a dark bottle. Morphia possesses the advantage over atropine of diminishing secretion and lessening irritability without subsequent inflammation being produced. A mixture of morphia and apomorphia he has found extremely useful in difficult expectoration, while a combination of morphia and atropine has given excellent results in catarrh, emphysema and phthisis.

Two new anæsthetics, diethylacetate and dimethylacetate, have recently been experimented with by Dr. Mering (*New Remedies*, Feb., p. 51). The former has a burning pungent taste and the latter a disagreeable taste and smell. Both rapidly produced narcosis in frogs and rabbits, slowing the action of the heart, weakening the respiratory movements and acting, when inhaled, much like chloroform. The former was tried on criminals; it acted well, causing narcosis without bad after effects.

Dr. M. Czartoryski, writing to the *Lancet* (p. 261, Feb. 10), from California, states that the Chinese place great reliance on the internal use of fresh lime juice, and of the fruit itself, in diphtheria, and that the results are apparently most successful. Following their example, he has found the same advantages to accrue from its use even in the most desperate cases.

MM. Coninck and Pinet (*Comptes Rendus*, Jan. 15, p. 200) give an account of physiological experiments made on the frog, guinea-pig and dog, to determine the action of picoline and lutidine. They find that picoline abolishes the excito-motor power of the nervous system, thus approaching cicutine in its action. β-lutidine obtained from cinchonine has a similar effect, as also β-lutidine derived from brucine, but the latter acts more rapidly and diminishes muscular contractility, the hydrochlorate being still more active.

The recent introduction of a preparation of the seeds of *Abrus precatorius* (jéquerity seeds) in the treatment of ophthalmia will lend interest to an investigation of them by Dr. Warden, of Calcutta. In a preliminary physiological experiment, half a seed, rubbed down with a small quantity of water, and injected into the thigh of a full-grown cat, produced fatal effects within twenty-four hours. This is in accordance with what is alleged to be a practice in some parts of India of using small spikes prepared by drying a paste of the powdered seeds for felonious cattle-poisoning, the spikes being fastened on to the end of a stick after the manner of a drover's goad. The only special principle which Dr. Warden has succeeded in isolating is an acid, which he represents by the formula $C_{21}H_{24}N_3O_4$, and has named "abric acid;" but this proved to be non-poisonous. There appears to be no question that a poisonous principle of considerable potency is present in the seeds, and Dr. Warden thinks his failure to isolate it may be due to its susceptibility to the action of reagents or heat, to its volatility, or that having a composition analogous to amygdalin, its poisonous properties require for their development the action of a principle allied to emulsin.

The composition of cacao butter has been engaging the attention of Herr Traub (*Archiv*, xxi., 19), who is, however, unable to confirm the experience of Mr. Kingzett (*Pharm. Journ.* [3], viii., 412), as to the presence in this fat of two new fatty acids, one of them, which he named "theobromic acid," having the formula $C_{64}H_{128}O_2$. The highest member of the $C_nH_{2n}O_2$ series recognized by Herr Traub was arachic acid, $C_{20}H_{40}O_2$, the other acids obtained being oleic, lauric, palmitic and stearic acids. He is of opinion that the solid consistence of cacao butter coincident with a low melting point is dependent upon the peculiar relative proportions in in which these acids are present.

Some experiments have been made by Herr Müller (*Pharm. Central.*, 1882, p. 581), having for their object to ascertain whether the composition of tamarinds is approximately constant. The pulp of nine specimens obtained from various sources, freed from seeds, showed the greatest variation in respect to citric acid, one specimen containing 3·95 per cent., and another only 0·64 per cent., and it may be remarked that Dr. Nessler has reported the presence of 13·5 per cent. in a specimen examined by him. The other constituents found were:—tartaric acid, ranging from 5·29 to 8·80 per cent.; potassium bitartrate, from 4·66 to 6·01 per cent.; water, from 21·92 to 32·58 per cent.; and vegetable fibre from 12·6 to 20·2 per cent. The relative proportion of the seeds varied enormously, one specimen containing 1·5 per cent. and another 38 per cent. It is evident that the proportion of this last constituent has an important bearing upon the value of the drug, and the author is of opinion that 10 per cent. should be the maximum of seeds allowed.

Mr. Martin, referring (*Druggists' Circular*, Feb., p. 17) to the coloration which takes place in a solution of salicylate of sodium, after being kept for a short time, says that it may be obviated by an addition of a small quantity of sodium hyposulphite. He prepares a solution which he finds to keep indefinitely, by rubbing 16 ounces of salicylic acid into a paste with 1 pint of boiling water, adding 1 drachm of sodium hyposulphite, and then gradually pouring upon it a solution of 9 ounces of sodium bicarbonate in 1½ pint of boiling water. After filtration through paper sufficient water is added to make the product measure 4 pints.

According to some experiments recently described before the Société de Biologie, by Dr. Laborde, which were suggested by the recent disclosures as to the adulteration of the quinine supplied to the Paris hospitals, the physiological effects following the subcutaneous injection of quinine and cinchonine differ considerably. Two guinea-pigs were submitted to injections; one of them received twenty centigrams of the quinine adulterated with cinchonine, and the other twenty centigrams of pure quinine. The former was attacked almost immediately with violent convulsions and died in the course of twenty minutes; the other presented the well-known phenomena of quinism, collapse and ataxia, but did not die until after fifty or sixty minutes. Dr. Laborde pointed out, as a clinical fact of importance, that certain diseases, as for instance, typhoid fever, involve a predisposition to symptoms resembling those following the administration of cinchonine. If the observations of Dr. Laborde are confirmed in experience it is manifest that they will have an important bearing upon the use of preparations of red bark, such as the mixed alkaloids and those which have recently been made official in the United States Pharmacopœia.

A few months since Dr. Hesse stated (*Pharm. Journ.*, [3], xii., 517) that in a peculiar thin kind of cuprea bark, of a much paler colour than the ordinary bark of the *Remijia pedunculata*, he had found, in addition to cinchonine and a new alkaloid, a large quantity of aricine and cusconine. This "new alkaloid" he now believes (*Berichte*, xvi., 58) to be identical with the "hydrocinchonine" of Caventou and Willm, and the alkaloids he then regarded as aricine and cusconine, he now finds to consist of several new bodies. At present Dr. Hesse has separated an alkaloid which he calls "concusconine," as standing in the same relation to cusconine as quinidine to quinine; another which he has named "concusconidine," analogous to cusconidine, and a third, somewhat resembling aricine, which he believes may eventually prove to be identical with Arnaud's cinchonamine. Concusconine (m.p. 144°) gives $(\alpha)_D + 36{\cdot}8$ (whilst cusconine melts at 110°, deflects the ray of polarized light (54·3° to the left), and crystallizes from alcohol with one molecule of water of crystallization. Concusconidine, $C_{23}H_{26}N_2O_4$, (m.p. 124°) is an amorphous yellowish white powder and gives a sulphate which gelatinizes from boiling water, but which soon becomes transformed into a mass of delicate needles. The alkaloid resembling aricine has the composition $C_{19}H_{24}N_2O$ (m.p. 184°), and gives a sulphate, $(C_{19}H_{24}N_2O)_2SO_4H_2$, which crystallizes from alcohol in colourless prisms, readily soluble in water. It is dextro-rotatory, whilst aricine is lævo-rotatory. As Dr. Hesse is extracting

the alkaloids from about 100 kilos of this bark there is a possibility of the discovery of other alkaloids and an elucidation of the question as to the identity of cinchonamine. Diconchinine (diquinidine) and a small quantity of cincholine are also separable from the amorphous bases of cuprea bark, and more conviently than when dealing with cinchona bark.

In these days of unbelief it is satisfactory to learn (*Berichte*, xvi., 60) that Dr. Hesse has confirmed the independent statements of three sets of observers as to the existence of a peculiar alkaloid in cuprea bark,—"homoquinine," "ultraquinine" or "cupreine,"—by an examination of a portion of the alkaloid obtained by Messrs. Paul and Cownley in their investigation. He states moreover that, although working with quinine and quinidine of absolute purity and prepared from cuprea bark, he has been unable to obtain the compound of quinine and quinidine which Messrs. C. H. Wood and Barrett stated they had prepared.

The observation that the essential oils of chamomile, wormwood, and millefolium, though varying in colour, when examined spectroscopically all give three absorption bands in the red and orange, led Herr Hock to suspect that there is a colouring matter common to them all (*Archiv*, xxi., 17). Upon submitting samples to distillation the first portion was obtained colourless; but on exceeding 150° C. greenish and blue-green portions passed over, and at 260° C. an intensely blue distillate, which showed the three absorption bands most distinctly. An examination of other similar oils led to the conclusion that although differing in chemical composition they all contained the same blue colouring matter (azulen). It would appear that this blue body is sometimes formed in the plant, and sometimes is first produced during distillation in the vapour of water, or at a higher temperature, as in the dry distillation of galbanum. The formation appears to be associated with the age of the oil, a somewhat resinified oil yielding a larger blue fraction than an equal quantity of a perfectly fresh sample.

Dr. H. P. Farnham, in a paper read before the Materia Medica Society of New York (*New Remedies*, February, p. 39), calls attention to the fact that the sulphocarbolates met with in commerce vary much in purity, some specimens that he had met with producing vomiting and prostration when taken internally. These specimens were not of English manufacture, the only satisfactory samples that he could obtain being prepared by one of the leading chemical firms in England. Dr. Farnham gives as a test for the purity and safety of the sulphocarbolates, that they should give off scarcely any odour of carbolic acid, should have a definite crystalline form, and should give no precipitate with chloride of barium. In other words, they should not contain free carbolic or sulphuric acid, and a preparation offered in the form of an amorphous powder should not be used. The pure salt also makes a perfectly clear solution in water, but the impure a muddy one.

Curious mistakes are sometimes made with regard to the names of drugs sent from foreign countries; thus safflower seed has been offered for sale as sunflower seed. Recently a fragrant commodity appeared in the market (*Gardeners' Chronicle*, Feb. 10, p. 184) under the name of safflower, which had not the least claim to the name, inasmuch as it was found to consist not of composite florets but of the finely broken leaves of a labiate plant, *Zataria multiflora*, a native of Persia, Beloochistan and Afghanistan. It was shipped to this country from Bombay, but with what object it is difficult to conceive. The odour of the leaves somewhat resembles that of thyme.

A new variety of aniseed has lately appeared in the market, imported from Chili. Eighty-six bags of this variety were offered at the London drug sales this month, but fetched a low price, being small and not so free from stalks, etc., as European aniseed.

In a paper read before the Institution of Mechanical Engineers "On the Molecular Rigidity of Tempered Steel," by Professor D. E. Hughes, (*Electrician*, Feb. 3), it is shown that there is experimental evidence for believing that tempered steel is a true alloy of carbon and iron. The author's experiments were made with a simple modification of his well-known "induction balance." One of the conclusions arrived at is that iron possesses more coercitive force than steel whenever the inducing force is limited, and within the range of iron. The author has remarked in this and previous researches on molecular magnetism that in all alloys of iron the molecules are far more rigid than in the pure metal; and further that, with steel, tempering adds greatly to this rigidity. He is now engaged upon the effect of different tempers on the same steel, and hopes in a future paper to bring the results before the Institution. Soft steel, when compared with hard drawn iron, shows that the mechanical hardening of iron has not in any great degree diminished its molecular freedom. Even the softest steel shows a high degree of molecular rigidity, as compared with the hardest iron, but far less than that of tempered steel. This would seem to indicate that steel in its softest state is still an alloy, though only feeble quantities of carbon may be held in that condition.

The same eminent experimenter has communicated a preliminary note to the Royal Society "On a Theory of Magnetism based upon New Experimental Researches." The following conclusions have been arrived at:—(1) That each molecule of a piece of iron, steel, or other magnetic metal is a separate and independent magnet, having its two poles and distribution of magnetic polarity exactly the same as its total evident magnetism when noticed upon a steel bar-magnet. (2) That each molecule, or its polarity, can be rotated in either direction upon its axis by torsion, stress, or by physical forces such as magnetism and electricity. (3) That the inherent polarity or magnetism of each molecule is a constant quantity like gravity; that it can be neither augmented nor destroyed. (4) That when there is external neutrality, or no apparent magnetism, the molecules, or their polarities, arrange themselves so as to satisfy their mutual attraction by the shortest path, and thus form a complete closed circuit of attraction. (5) That when magnetism becomes evident, the molecules, or their polarities, have all rotated symetrically in a given direction, producing a north pole if rotated in this direction as regards the piece of steel, or a south pole if rotated in the opposite direction. Also, that in evident magnetism, there is still a symmetrical arrangement, but one whose circles of attraction are not completed except through an external armature jointing both poles. The experimental evidences of the above theory are said by the author to be

so extremely numerous and conclusive that he has ventured upon formulating the results in the above manner.

In a paper read before the Royal Society on the 1st inst., "On the Electrical Resistance of Carbon Contacts" (*Electrician*, February 10), Mr. Shelford Bidwell has adduced some reasons for the superiority of carbon over metal in the microphone. He considers that the mere fact that a current causes delicately-adjusted metal contacts to adhere to each other (an observation previously made by Mr. Stroh) seems sufficient to account for the superior efficiency of carbon. In addition to this phenomenon of adhesion, and probably connected with it, are the facts that metallic contacts, unlike those of carbon, do not even approximately recover their original resistance when once it has been reduced by increased pressure or increased current; unless, indeed, complete reparation occurs; and even the initial effect of pressure upon resistance is in general much more marked with carbon than with metals. In the case of carbon, pressure and current act in consonance with each other; pressure diminishes the resistance, and in so doing increases the strength of the current, and the current thus strengthened effects a further diminution in the resistance. In the case of metals, on the other hand (or at least in the case of clean bismuth), pressure and current tend to produce opposite effects. The resistance is diminished by pressure, and the current consequently strengthened; but by reason of the increased strength of current the resistance is *higher* than it would have been if the current had remained unchanged. The effect of this antagonism is not very great, but it seems sufficient to give a material advantage to carbon.

According to a paragraph in the *Electrician* of the same date, Mr. R. Barker has patented a process for extracting gold from its ore, by causing it to be washed by a stream of water over an inclined table, in which are placed at intervals "riffles," or baths of mercury. The mercury is connected with the negative wire of a dynamo-machine, and the positive wire is led to the water. It is found that the mercury readily seizes on and holds the particles of gold, and never "sickens," as has hitherto been the case.

The electrical transmission of power is justly regarded as one of the greatest future possibilities of electricity, hence much interest has been manifested in some public experiments in this direction, made before a large number of scientific men and social and political notabilities, assembled at the Northern Station, Paris, on the 6th inst. According to *Nature* of the 15th inst. the energy was transmitted by an ordinary iron telegraph wire from Paris to Sevran, near Le Bourget, and returning to Paris, thus completing a distance of 20 kilometres. The primary engine was moved by a force of about 5 horse-power, and the force of the secondary was said to be $2\frac{1}{2}$ horse-power. No precise measure was taken. The experiment was in continuation of the much spoken of Munich transmission of energy from Mierbach, according to the Marcel-Deprez system. It is not believed that this new experiment will put an end to the controversy, though many papers have reported enthusiastically on the proceedings, and letters have been written by electricians claiming to have executed more successful trials. It is stated that new experiments on the Marcel-Deprez system of transmission of energy will take place, under the superintendence of M. Tresca, with the same machines as on February 6. The *Lumière Electrique* states that the force transmitted is about $37\frac{1}{2}$ per cent., and that the dynamometer for measuring the motive power of the primary machine was not in order at the time of the first experiment.

In a lecture on the "Progress of Telegraphy," which was the first of a series of six to be delivered before the Institution of Civil Engineers, Mr. W. H. Preece, last Thursday, presented to his hearers some interesting details. Premising that telegraphy is the oldest practical application of electricity, Mr. Preece remarked that electric currents for this purpose are, as a rule, maintained by the combustion of zinc in batteries of innumerable forms. In the British Post Office telegraph system three forms of batteries are used to the following extent—Daniell, 87,221 cells; Leclanché, 56,420 cells; and bichromate, 21,846 cells. Magneto-electricity is applied for some forms of apparatus and dynamo machines are sometimes employed to supplement batteries. Where the electric currents are conveyed from place to place overground the conducting wire used is almost exclusively of iron, but copper is much used in passing through smoky places. Phosphor-bronze wire is under trial, and appears to possess the conductivity of copper with the strength of iron. The quality of iron wire has been greatly improved, and it conducts now 50 per cent. better than it did a few years ago, whilst copper wire has improved in a still greater ratio. In towns the wires are carried underground; copper wire, insulated with gutta percha and encased in iron pipes, being the material used. There are now 12,000 miles of telegraph wire carried underground in the United Kingdom; to adopt the same course with respect to the whole of the Post Office system would involve an expenditure of £20,000,000, as the cost is fourfold, whilst the carrying power is reduced to one-fourth. Gutta percha still remains the best material for insulating purposes. Of submarine telegraphs there are now 80,000 miles of cable at work and a capital of £30,000,000 has been invested in them. A fleet of twenty-nine ships is employed in laying, watching and repairing the cables, and the Atlantic alone is spanned by nine cables in working order. The type of cable has been very little varied from the first laid between Dover and Calais, but the materials are better, the breaking strain of the homogeneous iron wire now reaching ninety tons to the square inch, whilst the machinery for laying has been so improved that a cable across the Atlantic was last year laid in twelve days, without hitch or stoppage. Of telegraph instruments the A B C is the simplest to read, and there are 4398 in use. Its mechanism is, however, complicated and expensive and it is being rapidly supplanted by the telephone. The needle instrument is the simplest in construction, but it requires training to read it; there are 3791 employed by the Post Office and 15,702 by various railway companies. The Morse instrument, of which the Post Office possesses 1330, records its letters in ink, in dots and dashes on paper tape, and also indicates the letters of the alphabet by sound. Sound reading is more rapid and accurate than any system of visual signals or permanent record and it is gaining ground with great rapidity, there being now about two thousand sound readers in England, while in 1869 there were none. Acoustic reading attains great perfection in Bright's bell instrument, where beats of different sound

replace the dot and dash of Morse's system. In ordinary working only one message can be sent in one direction at one time; but by a simple and ingenious contrivance, by which the neutrality of opposite currents is utilized to convey signals, duplex telegraphy is rendered possible, so that two messages can be sent on the same wire at the same time; and, by a still further improvement, where currents of different strength are utilized, four messages are sent on one wire—two simultaneously in opposite directions—at the same time. There are in England 319 duplex and 13 quadruplex circuits at work. In the automatic system, manual labour is supplanted by mechanism in transmitting the messages. There are 71 circuits worked by these instruments, and 224 instruments in use, and a speed of working of 200 words per minute is easily maintained upon them. With the hand alone from 30 to 40 words per minute is the maximum rate attained. Since this system can be duplexed, and in many cases is so, 400 words per minute on one wire are easily sent. By the use of high-speed repeaters, the length of circuit for automatic working is scarcely limited; it would be easy to send 100 words per minute to India. The growth of business since the telegraphs have been acquired by the State is enormous: 126,000 messages per week have grown to an average of 603,000. In 1873, the average number of messages per mile of wire was 147, it is now 256. It is in press work that the greatest increase has taken place: 5000 words per day at the time of the Companies have grown to 934,154 words per day now. The growth of business is equally discernible in the great Cable Companies. In 1871, the number of messages dealt with by the Eastern Telegraph Company was 186,000; in 1881, it was 720,000.

NEW REMEDIES.*

BY WILLIAM ELBORNE.

Abrus precatorius. Nat. Ord., Leguminosæ.—This plant was originally a native of India, but is now found in the West Indies, the Mauritius, and most tropical regions. It is remarkable for its small nearly globose seeds, which are of a brilliant scarlet colour, with a black scar indicating the hilum or place of attachment to the pods. These seeds are much used in India in the arts, for necklaces and other ornamental purposes, and are employed as a standard of weight under the name of Rati. The weight of the famous Koh-i-noor diamond was ascertained in this way. From a medicinal point of view the roots are made use of in the same manner as the roots of the liquorice plant (Indian Pharm.). An infusion of the curious scarlet seeds has long been used in the interior of Brazil as a popular remedy in the treatment of ophthalmic disorders. In some experiments made by Dr. de Wecker to test the action of this remedy, he found that a weak cold infusion made from the powdered seeds, when applied as a lotion, rapidly produced a purulent ophthalmia, of intensity corresponding to the number of applications made. The factitious ophthalmia thus produced disappeared in the course of ten days or a fortnight without any therapeutic intervention or danger to the cornea, and Dr. de Wecker is of opinion that this property possessed by the seeds, of provoking a very intense ophthalmia of short duration, could be utilized in ocular therapeutics in the treatment of granulations and conjunctival diphtheria. M. Silva Aranjo having recently submitted to microscopical examination the infusion and maceration of the seed, together with the exudation produced by their use, attributes the cause of the inflammation and the purulent condition which follows the use of the drug, to the great number of gonidia contained in both preparations of the seed developing abundantly on the conjunctiva.

Adonis vernalis. Nat. Ord., Ranunculaceæ.—This plant is a showy perennial herb with large yellow flowers, finely divided leaves, and black fascicled roots. It has been recently introduced into medicine as a remedy in the treatment of certain forms of heart disease. Dr. Cervello, who has recently submitted the plant to a chemical investigation, finds that its active principle is a glucoside which he has named adonidin. It is described as being colourless, odourless, amorphous and very bitter.

Adonidin is prepared by precipitating a tincture of the plant, made with 50 per cent. alcohol, with basic acetate of lead, and decanting and evaporating the clear liquid to a syrup. This syrup is bitter and slightly acid, and after being made slightly alkaline with ammonia it is boiled with a strong solution of tannin, until a precipitate is no longer thrown down. The tannate of adonidin thus formed is difficultly soluble in water. The precipitate, after being washed, is decomposed with zinc oxide in presence of alcohol, the alcoholic solution evaporated to a small bulk, and colouring matter precipitated with ether. The clear solution on evaporation gives the adonidin in a pure state. It is then dried *in vacuo* over sulphuric acid.

The therapeutic effects are described as being identical with those of digitalin, with the exception that they are not accumulative, the administration of the drug during a considerable time being without danger.

Convallaria majalis. Nat. Ord., Liliaceæ.—The lily of the valley is a plant so well known that little need be said by way of description. A slender irregular stalk, a few inches high and slightly curved, bears from eight to twelve small bell-shaped white flowers, arranged one above the other, each on a pedicel of its own, elegantly bending towards the ground, and of a delicate perfume. The lily of the valley is an inhabitant of the woods in many parts of England, and has long been admitted into every garden. Notwithstanding the fragrance of the flowers, they have a narcotic odour when dried, and if reduced to powder excite sneezing.

The medicinal properties of the lily of the valley have been known as far back as the early portion of the seventeenth century, as having a peculiar action upon the heart. But this appears to have been lost sight of until a year or two ago, when the fact of the plant being used by the Russian peasants as a remedy for dropsy, attracted the attention of Messrs. Troitzky and Bojajawlensky. Two glucosides were obtained from this plant by Walzy in 1858, and were named convallarin and convallamarin. In 1865, Stanislas Martin isolated an alkaloid and an acid, which he named respectively maialine and maialic acid, finding at the same time an essential oil and a yellow colouring matter.

Convallarin is soluble in alcohol, but insoluble in water. Convallamarin is very soluble in water, alcohol, and methylated alcohol, but insoluble in ether, chloroform, and amylic alcohol. It has a bitter flavour, followed by a peculiar after-taste. The plant contains only a small quantity of this glucoside, 1000 parts (collected in August) yielding only 2 of convallamarin. It is best prepared as follows:—According to Tanret, a strong tincture of the whole plant is precipitated with subacetate of lead, filtered; the excess of lead removed by dilute sulphuric acid, carefully avoiding excess, neutralized, and the tincture distilled, the last portions being driven off in the open air. The cooled and filtered liquid is then precipitated by tannin, being at the same time kept neutral by very slight additions of dilute solution of sodium carbonate. The precipitated tannate of convallamarin is then washed, dissolved in 60 per cent. alcohol, the solution decolorized with animal charcoal

* The subject of a Report on Materia Medica read before the School of Pharmacy Students' Association, Jan. 18, 1883.

decomposed with oxide of zinc, filtered and evaporated to dryness. Thus prepared it is nearly white, and has the appearance of ordinary digitalin. To free it from salts sometimes carried down by the tannin, it may be advantageous to dissolve it in 60 per cent. alcohol, filter and evaporate.

Drs. Bojajawlensky and Troitzky found that in organic heart disease the effects of the plant taken in infusion were equal to those of digitalis; the urine being increased, serous deposits rapidly absorbed and nervousness diminished; while cumulative action was not observed. The irritability and resulting peevishness were lessened, the effect continuing for some days after the administration of the medicine; no dyspnœa or palpitation being experienced; the patients also were able to take boldly exercise without discomfort.

Lycoperdon giganteum (*The Giant Puff-ball*).—*Lycoperdon giganteum* is a fungus belonging to the Nat. Ord. *Trichogastres*. The peridium or outer coat which breaks up into warts or scales, is intimately connected with the inner coat, and the spores are mostly sessile. All the various species of *Lycoperdon* are produced abundantly in nearly every country, but are so variable both in character and properties that it is very difficult to distinguish them.

Dr. E. Thompson recalls attention in the *Lancet* to the use of this fungus as a local hæmostatic. He states that it forms a very soft and comfortable surgical dressing, and that the powder it contains seems to possess antiseptic and anodyne properties. The mature plant is used. At this period it is about the size of a child's head, and is covered with a thin skin; the latter is removed and the capillitium and spores, which form a dusty mass, are used. Mr. Fagan, a leading surgeon in Belfast, found that it at once restrained bleeding from arteries in the bone, in the neighbourhood of the orbit, after the failure of other means. The researches of Hagen, on the reason of the coagulation of the blood, show that the hæmostatic action of the puff-ball, as well as of all other spongy or powdery substances, depends upon the fact that healthy blood deposits hæmato-blasts or minute corpuscles on any foreign substance introduced into a vein, which become adhesive points for the subsequent attachment of particles of fibrin. This action, however, also takes place when the vessels themselves assume abnormal conditions, as when cut or altered by disease.

Pongamia glabra. Nat. Ord., Leguminosæ.—*Pongamia glabra* is a tree extensively diffused throughout Southern India, Malacca and the Indian Archipelago, and also found in Southern China and North Australia. It has smooth pinnate leaves, composed of five or seven egg-shaped or broadly elliptical leaflets, arranged in pairs with a terminal odd one; and loose axillary racemes of flowers. In India an oil, called pongamia or kurung oil, is expressed from the seeds, which is described in most works on Hindu Materia Medica as being a favourite remedy amongst the natives for various skin diseases. The oil is of a deep yellow colour, inclining to reddish-brown, and is fluid at temperatures above 60° F., but below that it becomes solid.

Surgeon-Major Dymock, of Bombay, has recently called attention to the use of pongamia oil in pityriasis versicolor. Having observed that the specific character of the diseases in which the oil had been used was not clearly defined in the descriptions given by Ainslie and other writers, he determined to make some experiments with the oil, and selected pityriasis versicolor, as a common and troublesome affection, for the first experiment.

Several cases occurring on the neck, face, and shoulders were cured in less than a fortnight by rubbing in the oil twice a day. He concludes, therefore, that this oil is likely to be of service in other skin diseases which, like pityriasis, are attended by the growth of a fungus. Dr. Dymock considers this oil much more effective than acetic acid; while it has the advantage over iodine and Goa powder of not discolouring the part (often the face) to which it is applied. Dr. Thin has recently stated that sulphur ointment is an admirable remedy for ringworm; but pongamia oil might be used in cases where the disease is of a recurrent character.

Sterculia acuminata.—Cola, Gourou or Ombéivé nuts are the seeds of the above plant, which belongs to the natural order, *Byttneriaceæ*, and are known to us by the accounts of West African travellers, who state that when chewed they possess the power of rendering the flavour of water, even if half putrid, agreeable and they were believed to contain caffeine.

Cola nuts have recently been submitted to a chemical investigation by Messrs. Haeckel and Schlagdenhauffen, who found that they contained more caffeine in an uncombined state than the best samples of coffee that could be procured; also theobromine, three times the quantity of starch that is found in cocoa, a considerable quantity of glucose, a small percentage of fat, a special tannin approaching caffeotannic acid in its composition, and a red colouring matter similar to cacao-red. Professor Attfield in a previous analysis found also a small quantity of volatile oil.

The physiological examination of this remedy has shown that its properties are essentially due to the caffeine and theobromine it contains. The seeds, it appears, have long been in use in Africa for the cure of diseases of the intestine or liver, and especially in cases of atony of the digestive tract, and also as a masticatory and tonic, like areca nuts, which are so much esteemed by the natives of India. Medically they may occupy a prominent place by the side of coca and other anti-metabolic remedies, to which they would probably prove superior in consequence of the tannin they contain.

EAU DE COLOGNE.*

A very pleasant and refreshing eau de Cologne, much resembling that sold with the trade-mark "Springbrunn," may be obtained as follows:—

Dissolve 15 parts of oil of orange-peel, 15 of oil of lemon, and 6 of oil of bergamot in 3000 parts of finest Cologne-spirit. (It is absolutely necessary that only the purest and finest oils and alcohol be used.)

Also dissolve 1 part of oil of neroli (pétale) and 1·5 parts of oil of orange (petits grains) in 1000 parts finest rectified rye-spirit.

After standing for five or ten days, both liquids are mixed. It is best to distil the mixture, since the odours are better blended thereby; but it may also be aged by allowing it to stand for a time.

To the distillate are added 2 parts of the finest oil of rosemary, and the liquid then put up in small well-corked vials, which must be kept in a cool, shady place.

TROPIC FRUIT LAXATIVE.†

Mr. Adam Conrath gives the following approximative formula for the preparation sold under the name of "Tropic Fruit Laxative":—Jalap tubers, powdered; senna leaves; sugar, of each 5 parts; pulp of East India tamarinds (of the consistence of a stiff extract), 30 parts.

Having rolled out the mass with a rolling-pin to a thickness of $\frac{1}{4}$ of an inch, it is to be cut with a tin mould to a size of one inch long by $\frac{7}{10}$ of an inch wide, to weigh 40 to 45 grains. The lozenges should be coated by a confectioner with chocolate and sugar, after which each one may be wrapped in thin tin foil. Mr. Conrath says that the objection to dispensing this form of a confection of senna is the liability of the laxative portion to become worm eaten, in which case, those who do not first remove the chocolate and examine the central mass are apt to swallow worms and all.

* From *New Remedies*, February, 1883.

† From the *Pharmacist*. Reprinted from *New Remedies*, February, 1883.

The Pharmaceutical Journal.

SATURDAY, FEBRUARY 24, 1883.

Communications for the Editorial department of the Journal, books for review, etc. should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE BENEVOLENT FUND.

ON subsequent pages will be found a list of the subscriptions and donations to the Benevolent Fund received during last year, which has been prepared in accordance with a resolution of the Council of the Pharmaceutical Society at its meeting in November that such a list should be printed in this Journal and a copy sent to every chemist and druggist whose name is on the Register. In thus carrying out the decision of the Council it has appeared to us that if the list were prefaced by a short statement as to the origin and past administration of the Fund it would enable some who receive it better to understand the nature and objects of the appeal which is to be made to them for help.

From the very inception of the Pharmaceutical Society, when in the year 1841 a few energetic spirits were endeavouring to give form to a belief that the permanent interests of chemists and druggists required the establishment of some organization for securing their common welfare, it was recognized that the "foundation of a fund for the relief of the distressed, the widow, and the orphan" would help to establish a substantial and permanent bond of union. Consequently, upon the establishment of the Pharmaceutical Society no time was lost in connecting with it the work of benevolence. In the first year only £37 17*s.* was received in donations; but in the first annual report the Council recommended that a sum of £500 from the funds of the Society should be invested in the names of trustees, as the nucleus of a fund, from which relief should be granted as soon as the annual income from investments should amount to £300. In the following year the Society obtained its Charter, in which the provision of a fund for the relief of distressed members and associates of the Society, and of their widows and orphans, was formally mentioned, and in "commemoration" of this, the Council in its second annual report recommended that another sum of £500 should be set apart for the Benevolent Fund. A similar course was taken in the following year, and again in 1870. In 1848, although the interest on investments had not yet reached the amount originally intended, it was decided to commence the granting of casual relief from the Fund; but it was not until the year 1865 that the first elections of annuitants took place.

Hitherto the Benevolent Fund, which had been formed mainly by successive grants from the General Fund of the Pharmaceutical Society and subscriptions and donations from its members and associates, had been administered solely in the interests of persons who were connected with the Society. But the area was to be now widened, for in the year 1868, when the accumulated investments amounted to nearly £10,000, the Council was empowered by the provisions of the Pharmacy Act to extend the benefits of the Fund in future to all persons "who may be, or have been, duly registered" as Chemists and Druggists. This permission has been fully utilized by the Council, and at the present time as many as eleven annuities, amounting altogether to £370 a year, are being paid from the Fund to registered chemists and druggists who have never been connected with the Society, or to the widows of such persons, whilst last year, besides this, the casual relief given in the same direction amounted to upwards of £160. It was justifiable to hope, therefore, that so catholic a dispensation of relief from the Fund would have been met by help, however small, from nearly every person whose name is on the Register, but, unfortunately, at present scarcely any advance has been made towards the realization of this hope. It is true there was some improvement manifest last year; though even then the total number of subscribers was only just over three thousand, so that there are *still more than ten thousand registered chemists and druggists who do not subscribe to the Benevolent Fund, or more than three-fourths of the whole!* It is impossible to believe that this is a fair indication of the measure of charitable feeling existing among the chemists and druggists of Great Britain, and the explanation is probably rather to be found in the absence of proper machinery for bringing the Fund, at stated intervals, under the notice especially of those who for various reasons have abstained from associating themselves with the Pharmaceutical Society. As an aid towards supplying this deficiency a copy of this number of the PHARMACEUTICAL JOURNAL will be sent to every chemist and druggist on the Register, and it is intended that this shall be supplemented in as many cases as possible by a visit to each recipient from the Local Secretary of the district, who will supply any other information about the Fund that may be desired and afford him an opportunity of satisfying his benevolent instincts with the least amount of trouble possible.

It would appear almost a work of supererogation to argue the necessity for the existence of some such organization. Every chemist and druggist must be cognizant more or less of the distress that exists among the unfortunate members of his craft or in families that have been bereft of the bread-winner, though few perhaps see it in the concentrated form in which month after month it comes under the observation of the Benevolent Fund Committee. It will be

more to the purpose to mention a few simple facts to enforce the appeal now made on behalf of the Benevolent Fund which has been administered so successfully during a period of forty years by the Council of the Pharmaceutical Society. Last year twenty-one annuitants received from the Fund £35 each, one £32 10*s.*, and fourteen £30 each, amounting altogether to £1187 10*s.*; besides which casual grants were made to the extent of £461, representing a total of £1648 10*s.* It may be desirable to explain that the variation in the amounts paid to different annuitants is in accordance with a resolution arrived at some years since, that annuitants above the age of sixty-five should henceforth receive £35 instead of £30 per annum. Towards meeting this outlay of £1648 10*s.* the dividends on invested capital only amounted to about £560, or less than half the sum required for annuities alone, leaving a sum of nearly £1100 to be made up by subscriptions and donations. Under the conditions which usually obtain in the administration of charitable funds this deficiency would have been largely increased by various expenses; but owing to the manner in which this Fund is administered, under the personal supervision and as part of the business of the Council of the Pharmaceutical Society, this large sum of money was collected and disbursed at a cost to the Fund of a little over ninety-five pounds. It is not likely that the calls upon the Fund during the present year will fall below those of last year; indeed the election of annuitants in December increased the responsibilities to the extent of at least £180 a year, and this did not represent all that might have been done with advantage in the same direction. Moreover, there is a constantly increasing necessity for casual relief, the sum granted this month,—namely, £150,—being larger than on almost any previous occasion. But if, as it is hoped, the present appeal is responded to favourably by even a moiety of the ten thousand registered chemists and druggists who are not at present subscribers, the anxiety of the Council will be removed, and it might become possible to dispense assistance more in accordance with the antecedent circumstances of those receiving it.

It only now remains to say that whilst the casual grants are made directly by the Council, upon the recommendation of its Benevolent Fund Committee, the election of Annuitants lies entirely with the Subscribers and Donors. Half-a-crown subscribed annually entitles the giver to one vote, but the number of votes is increased to five for each half-a-guinea. A contribution of five guineas constitutes a life subscriber, with five votes at each election for life, and an additional vote is accorded for each additional guinea. In the case of firms or corporations contributing five guineas, the right is acquired to a similar number of votes at each election for a period of ten years. We hope that the present special effort to increase the number of subscribers to the Fund, by bringing it under the immediate notice of every member of the body for whose benefit it is exclusively applicable, will be sufficiently successful to warrant the Council in repeating it annually. For it must be evident that, welcome as donations may be, the regular income from annual subscriptions is the only reliable basis upon which the Council can regulate the expenditure.

1843 AND 1883.

It is certainly a noteworthy, though an undesigned, coincidence that the resolution of the Council of the Pharmaceutical Society to send a copy of its Journal to every chemist and druggist on the Register should take effect in a week which marks the completion of a period of forty years since the granting of the Society's Charter of Incorporation on February 18th, 1843. The occasion will, therefore, not be an unsuitable one to take a retrospective glance and note some changes in the condition of the calling of a chemist and druggist which have occurred subsequently to, and we believe have been consequent upon, the establishment of the Pharmaceutical Society of Great Britain, of which this charter was the first official recognition.

It is in the power of only the older members of the body now to have a personal remembrance of the status—or more correctly the want of status—of chemists and druggists in Great Britain before the year 1840. The manor of pharmacy was then truly a "no man's land," and no restrictions were in existence as to qualification. Among those who in those days practised the art of pharmacy, it is true, were men equal in ability to any of their successors in the present day. But, on the other hand, the most ignorant of men was allowed, if he chose, to dub himself "chemist and druggist," and to carry on business as such with those members of the public whom he could induce to pin their faith to the colour of his carboys, the smartness of his shop or any other specious pretence that he might be able to put before them. Neither was there any bond of union between those who were more or less justified in assuming the name of "chemist and druggist." It was in this condition of affairs that a few of the more watchful members of the calling became aware, in the year 1841, that a Bill had been introduced into Parliament by Mr. Hawes, which, while affecting in its title only to amend the law relating to the medical profession, would have placed the whole body of chemists and druggists under the control, in respect to education and examinations, of a Medical Council in which they had no representative. The Bill would also, in Jacob Bell's words, have made a chemist and druggist "liable to a penalty of twenty pounds for recommending ten grains of rhubarb, strapping a cut finger, or explaining to a customer the usual mode of taking any medicine." Fortunately, through

the vigorous opposition that was organized, though not without considerable difficulty, the danger was for the time averted. But it became evident to those who conducted the opposition that it was necessary to establish some permanent organization for promoting the interests of chemists and druggists, if their independence was not to be sacrificed and many existing privileges lost through the institution of an extraneous jurisdiction. Action trod upon the heels of conviction, and within six weeks of the first note of alarm, the memorable "pharmaceutical tea party" was held at 338, Oxford Street, which eventuated in the foundation of the Pharmaceutical Society of Great Britain. From that time, it may be fairly said there was little danger that chemists and druggists would be legislated for without knowing the reason why.

It was early recognized by the founders of the Pharmaceutical Society that a too plausible pretext for the harassing proceedings of ambitious medical reformers existed in the absence of any judicious regulations for connecting the welfare of chemists and druggists with the interests of the public. In a preliminary report it was therefore recommended that "education, examination, registration and representation" should form the basis of the new Society, and to these was afterwards added "benevolence." These objects have been steadily kept in view by successive Councils, and notwithstanding much apathy, or occasionally even opposition, the work has been steadily carried forward, so that although the measure of success has not been so full as might have been hoped, the progress that has been made is considerable. Pharmaceutical education, which was first treated with indifference, even when provided at the cost of the Society to its members and associates, is now eagerly sought for at various schools established as independent commercial speculations; examination and registration have, in presence of a rapidly increasing population, for a time rendered stationary the number of persons entitled to carry on business as "chemists and druggists," and have raised the body considerably in the estimation of the medical profession and the public; whilst benevolence has created a Fund from which a very large amount of assistance is distributed continually to distressed members of the calling. Moreover, instead of chemists and druggists being now harassed and worried by unexpected attempts at legislation, such is the confidence which the prudent conduct of the Council of the Pharmaceutical Society has established that it has been entrusted with important executive functions on behalf of the public, and it is now almost uniformly consulted by the various Government departments upon subjects which arise touching the interests of pharmacy.

Under these circumstances we think it is to be regretted that the roll of Members and Associates of the Pharmaceutical Society is not co-extensive with the Register of Chemists and Druggists. That the legislation obtained by the Society in 1868 was not more favourable was no fault of those who then conducted its affairs, but rather lay with those who stood aloof from or even opposed the efforts of the Society when all ought to have been united. Nevertheless, evidence that the legislation of 1868 had its value is to be found in the wide-spread complaints that it did not include a provision to meet a contingency which could not have been foreseen at the time it was passed. An effort is now, however, to be made to supply its shortcomings, and as almost all pharmacists are agreed that Parliament should be approached with an application for fresh legislation, it does seem very desirable that the Council of the Pharmaceutical Society should be actively supported at such a time by at least every chemist and druggist in business. We do not affect to ignore that many persons outside the Society,—and, indeed, some inside,—profess to be dissatisfied with the work done by the Society; but that is not, in our opinion, a sufficient reason for helping to neutralize, by simple abstention, the influence of the most powerful organization which chemists and druggists are likely to have at their disposal during the present century. Such a plea is deprived of any force it might have had by the fact that so fully has the principle of "representation" been carried out by the founders of the Society and their successors that it is in the power of the general body of chemists and druggists to mould its policy as they will; for all persons on the Register, whether examined or not, have the option of connecting themselves with the Society either as Members or Associates, and so to become entitled to take a part in controlling its operations. We may be pardoned, therefore, for expressing a hope that many under whose notice these lines will be brought through the extra issue of this Journal may be persuaded that such a step is in accordance with their true interests.

THE PROPOSED PHARMACY BILL.

It might naturally be expected that the publication of the Draft Pharmacy Bill adopted by the Council would give rise to considerable discussion. We have already evidence of this in the receipt of several instalments of correspondence upon the subject, which in consequence of the somewhat special character of this number of the Journal we think it desirable to defer dealing with until next week. A meeting of chemists and druggists has been held at Manchester, to discuss the subject, and has been adjourned for a month, and another one is being held in Edinburgh at the time of going to press.

SCHOOL OF PHARMACY.

As will be seen by the advertisement in the present number, the courses of lectures on "Chemistry and Pharmacy" and "Materia Medica and Botany," in connection with the Pharmaceutical Society's

School of Pharmacy, 17, Bloomsbury Square, will recommence on Thursday, March 1, at 9 a.m., when Professor BENTLEY will give his first lecture on Botany. Professor REDWOOD will commence his course on "Chemistry and Pharmacy" on Monday morning, March 5, at 9 o'clock.

Students will find the ensuing five months a favourable period for studying at the School, for between March 1 and the end of July they will have an opportunity of attending not only Practical Chemistry in the laboratories and the usual courses of lectures on Chemistry and Pharmacy and Materia Medica and Botany, but also the summer course on Practical Botany and the Classification of Plants, at the Royal Botanic Society's Gardens, in the Regent's Park, where every opportunity will be afforded to them of obtaining a practical acquaintance with medicinal plants.

In addition to the above courses of lectures and Practical Chemistry, there is also Mr. DIMMOCK's class for "Practical Instruction in Dispensing," which will recommence on Friday, March 2, at 5 p.m., and be continued until the end of July.

The preliminary matter of the newly published Medical Register for 1883, includes, in addition to reprints of the existing Medical Acts, some interesting statistics. From these it appears that the total number of registered medical practitioners in Great Britain and Ireland, at the commencement of the year, was 23,081, showing an increase of 525 as compared with the previous year. The number added by registration during the year 1882 was 1171, and the restorations were 199. On the other hand, there were 522 names removed upon ascertained evidence of death, 10 through ceasing to practise, and 311 through failure to respond to two registered letters.

* * *

It is interesting to notice, in the presence of this large influx into the medical profession, that there was a considerable falling off in the number of medical students registered during the year 1882, the number being 1862, against 2171 in 1881. Of these 853 were registered in England, 585 in Scotland, and 424 in Ireland The University of Cambridge had 72 entries, a larger number than any other place of medical study, and St. Bartholomew's Hospital, London, came next, with 69. It is significant of the great change that has taken place in the conditions of medical study in recent years, that out of the 1862 registrations, only 169 were in respect to pupilage with a registered practitioner.

* * *

From a similar table in *The Dentists' Register* for 1883, of which also we have received a copy, we learn that there are now 5252 registered dentists in the United Kingdom, of whom 759 are "licentiates in dental surgery" of various colleges. This shows a decrease of 93 registered dentists as compared with the previous year. Of registered dental students there are 166.

* * *

In reply to a question, Earl Granville stated, on Tuesday evening, that it is the intention of the Government to introduce into the House of Lords a Bill dealing with the subject of the Medical Council.

* * *

A Bill which has been introduced into the House of Commons, by Mr. A. Arnold, for the amendment of the Trade Marks Act, provides that after the expiration of five years from the date of registration of a trade mark, the original registered proprietor, or any subsequently registered proprietor lawfully claiming through him, shall have an absolute and unimpeachable right to the exclusive use of such trade mark.

* * *

A Partnerships Bill has been again introduced into the House of Commons, but it is devoid of the sections referring to the registration of firms and limited partnerships present in the Bill of last year, and to which we then called attention as being likely to affect the working of the Pharmacy Act.

* * *

A decision, given by the tribunal of the Seine, on the 3rd instant, has established that the French law regulating pharmacy does not allow of a pharmacy being carried on by any person who is not at the same time the real proprietor and a qualified pharmacist. The principle was distinctly laid down, that the responsibility of the proprietor of the pharmacy was the best guarantee to the public that the business should be efficiently carried on. The decision was given in connection with a prosecution of M. Bravais, formerly manager of the Company trading under the name of Bravais and Co., and M. Jolly, an unqualified man who was carrying on the business as liquidator of the Company.

* * *

A Pharmacy Bill has been introduced into the Nebraska Legislature which contains two novel definitions of classes of poisons. The first class is to include "any drug, chemical or preparation which according to standard works on medicine or materia medica is liable to be destructive to human life in quantities of 60 grains or less." These are to be labelled "poison," and are not to be delivered until the seller has satisfied himself that they are to be used for a legitimate purpose. The second class is to include "poisons" which are known to be destructive to adult human life in quantities of 5 grains or less, and sales of these are to be registered. Agricultural insecticides are to be excluded from the operation of the clause.

* * *

The Pharmaceutical Society of Victoria has just concluded the purchase from the Colonial Government of some premises now occupied as a County Court in Swanston Street, Melbourne.

* * *

Extra buildings are being erected adjoining the Imperial Museum, Calcutta, for the International Exhibition which is to be opened next December. Invitations have been sent throughout India to all the Rajahs and Princes, inviting them to contribute to the Indian display, which is to be on a very grand scale. It is to be hoped that a good descriptive catalogue of the exhibits will be prepared.

* * *

Many of our readers will have inferred from the frequent occurrence of German looking names at the head of articles quoted from transatlantic journals that the Teutonic element is pretty well represented among pharmacists in the United States. But few

probably will learn without surprise that the New York German Pharmaceutical Association numbers 116 members.

* * *

A school of pharmacy has been organized in Louisville, Kentucky, for the education of women only. It is under the patronage of the local Polytechnic Society, and the members of the Board of Directors are all of the sterner sex.

* * *

According to the *Neue Dörptsche Zeitung*, the number of students in the Dorpat University in January, was 1431, of whom 610 were engaged specially in medical studies, and 103 in pharmaceutical studies.

* * *

A correspondent of the *Students' Journal* tells a good story about an accident that happened a few days ago in Kent, by which a carter's leg was broken. The man's companion ran off to the local practitioner for help, telling him that there was an "old cove" pulling his friend about, but, added he, "I can see he ain't up to much." When the local practitioner arrived on the scene he found that the "old cove" not "up to much" was Sir James Paget, who had in the meanwhile improvised some splints and bound up the leg with a copy of the *Times* newspaper.

* * *

We have received a circular announcing the commencement of the "Colchester Students' Association," which is worth referring to for the sake of mentioning a plan that might perhaps be followed with advantage in some other provincial localities. We are informed that the Association was mainly founded by chemists' apprentices, who at first intended to call it the "Colchester Chemists' Assistants and Apprentices' Association." Being doubtful, however, of their ability to stand alone, the title was altered so as to include other young men residing in the town; but the titles of the scientific papers read last year show that the original object of the founders has not been lost sight of.

* * *

According to *Nature*, the sulphuric acid works in connection with the Imperial Japanese Mint, at Osaka, are in active operation, nearly a million pounds of acid having been exported to China last year, besides supplying the home demand. Alkali manufacture also is being developed energetically.

* * *

At the meeting of the Chemical Society on Thursday next there will be a ballot for the election of Fellows, and a paper will be read on "Some Derivatives of the Isomeric $C_{10}H_{14}O$ Phenols," by Drs. Armstrong and Rennie.

* * *

The Chemists' Assistants' Association will meet at their rooms, 53, Conduit Street, on Wednesday evening next, when a paper on "Tobacco of Commerce" will be read by Mr. C. E. Palmer.

* * *

It may interest some of our readers to learn that on Monday next, the 26th instant, Professor Flower will commence, at the Royal College of Surgeons, a course of nine lectures upon the "Anatomy of the Horse and its Allies," which are to be free to all who take an interest in the subject. The lectures are to be delivered on Mondays, Wednesdays and Fridays.

Transactions of the Pharmaceutical Society.

NORTH BRITISH BRANCH.

EVENING MEETING.

The fourth Evening Meeting of this Session was held in the Society's Rooms, 119A, George Street, Edinburgh, on Thursday, February 15, at 9 o'clock.

Mr. Alexander Napier, President of the Branch, in the chair.

The minutes of the former meeting were read and confirmed.

The Secretary to the Branch then announced the following donations.

To the Library:—

'New Commercial Plants and Drugs.' By Thomas Christy, F.L.S. (in six parts). From the AUTHOR.

To the Museum:—

Seeds of *Ptychotis Ajowan*.

From Mr. JOHN R. HILL, Edinburgh.

Resin of Scammony and Resin of Jalap.

From Messrs. T. and H. SMITH and Co., Edinburgh.

Large Crystals of Potash Alum, Bichromate of Potash, Sulphate of Copper and Yellow Prussiate of Potash.

From Mr. ALEXANDER NAPIER, Edinburgh.

Calumba Root Starch.

From Mr. JAMES MCGLASHAN, Edinburgh.

A vote of thanks having been accorded to the donors, the Chairman called upon Dr. Matthew Hay to deliver a lecture on "The Methods for the Separation of Alkaloids." This paper and the discussion thereon will be printed in next week's Journal.

Provincial Transactions.

OLDHAM CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

On Tuesday, February 12, at the rooms of the Association, the Church Institute, Oldham, the first lecture of the present session was delivered by Mr. A. Martin, the President, on "The way to prepare for the Minor."

The lecturer, who spoke for above an hour, dealt in turn with each of the six subjects of the Minor examination, and pointed out the work that should be done, and that which it would be as well to leave alone. He strongly insisted on the untrustworthiness of "cram," and the urgent necessity for honest systematic study.

The lecture was listened to with marked attention, and at its close a hearty vote of thanks was unanimously given.

Nearly all the members were present.

Proceedings of Scientific Societies.

ROYAL INSTITUTION.

THE PRIMÆVAL ANCESTORS OF EXISTING VEGETATION AND THEIR BEARING ON THE DOCTRINE OF EVOLUTION.

BY PROFESSOR C. W. WILLIAMSON.

The fourth lecture of this course was delivered on Tuesday, February 6. The following is an abstract:—

The alternation of sexual and spore-bearing generations already noticed in the Equisetums probably attains its most conspicuous manifestation, so far as the Cryptogams are concerned, in the Ferns. Yet the prothalloid or sexual condition in Ferns is a varied one. In the Hymenophyllums, or Filmy Ferns, in its development it rises but little above that of the Protonema of the Moss;

but in most other Ferns, or in the Polypodiaceæ, the Prothallus becomes a heart-shaped thalloid structure, even less like that of the mosses than in the diœcious form seen amongst the Equiseta. Another characteristic of the fern prothallus is its uniformly diœcious nature, as well as its commonly obcordate form; two features which cause this organism to be of little value in the distinction of genera and species. The classification of living Ferns mainly rests upon variations in the structure and arrangement of their spore-bearing organs. The spores are enclosed in "sporangia," or little cellular boxes. In most cases each of these sporangia is more or less surrounded by a linear series of large corner cells, which become elastic when ripe, and which are strong enough to tear open the sporangia and liberate the spores. Variations in the form and condition of this annulus characterize the primary groups. It is wanting in the Marattiaceæ; it is limited to a small localized cluster of cells in the Osmundæ, and whilst it is more complete in all the other types, peculiarities of its position distinguish them from one another. In like manner there are variations in the number and position of these sporangia upon the frond. Attached to the under surface of the frond they are more or less isolated in Mohria and various Lygodiæ, but gathered together in clusters called *sori* in various other tribes. The genera are characterized by the form and position of these sori on the frond.

Fossil plants on which these sori are preserved are very rare, hence paleo-botanists have been unable to make use of them when classifying the Fossil Ferns. The method of Brogniart, who trusted to the arrangement of the nervures of the leaves in constructing his genera groups, has from necessity been adopted by more recent observers, but this method proves to be an extremely defective one. The number of known examples retaining their sori has much increased of late, and their discovery has shown that Brogniart's method has brought together plants that differ widely and has separated others that should be more closely united. Hence the classification of Fossil Ferns now is and must for a long time to come be in a very unsatisfactory state. When endeavouring to learn what the Fossil Ferns teach in reference to the theory of evolution, it is important to ascertain which of the numerous living types of Ferns may be regarded as the highest and lowest representatives of the group. In determining this point their *general* organization must be considered rather than that of special organs. Thus viewed, the delicate Hymenophyllaceæ seem to claim the lowest rank, and to come nearest to the Mosses. Like the latter plants, their leaves consists of a single layer of cells which corresponds to the much thicker mesophyl of the other forms, whilst the latter are also furnished with an upper and a lower epidermal layer, which not only is absent from Mosses, but also from the Hymenophyllaceæ. These latter plants also have sporangia of a peculiar form. These project from the margin of the frond, each one being sustained by a prolongation of one of the nervures of the leaf. Then the "prothallus" developed from a spore approached much nearer to the filamentous "protonema" of the Moss than is the case with this organism in other Ferns. Examining the Fossil Ferns as they present themselves to us as we descend through the scale of strata, we discover that, whilst many of the common living genera, such as Polypodium, Asplenium, Pteris, Osmunda, Adiantum, and several others seen in a fossil state, they are confined to the Tertiary rocks. On the other hand, the semi-tropical genus Gleichenia descends through the Cretaceous age, and has two representatives in the Oolites, whilst though the true Osmundas are only seen in Tertiary beds, one of the Osmundaceæ, a Todea, has also been found in the Oolites; but whilst Oolitic Ferns are comparatively abundant, most of them assume generalized forms, incapable of being identified with special living genera. The large fossil genera Pecopteris, Neuropteris, Sphenopteris, are defined by peculiarities in the form of their nervures, but they may well be regarded as mixed and ill-determined groups, out of which many of the more specialized modern types have been developed, an opinion which obtains support from such examples as have already been met with in which traces of the reproductive sori are still preserved.

These remarks apply equally to numerous Fossil Ferns of yet older date. The three genera just named occur in considerable numbers both in the Carboniferous and Devonian strata.

On leaving the Oolitic rocks we find some special examples that demand more minute examination. Both the Permian and the upper and lower Carboniferous rocks furnish examples of true Tree-ferns. In the two former they have been obtained rather abundantly at Autun, in France, and in the latter from the neighbourhood of Oldham, in Lancashire; but since we only know their stems, it is impossible to say to what group of Ferns we ought to refer them. But it is otherwise with the very distinct group of the Marattiaceæ. The peculiar forms of the sporangia in this aberrant type of the Fern tribe are so distinctive, that it is impossible to mistake them. We have three principal modifications of this type living; the Angiopteris, the Marattia, and the Danæa. We find the Angiopterids represented in the Tertiary strata, in the Oolites and in the Keuper. The Marattiæ have only been discovered in the Tertiaries, whilst the Danæa is represented by two Oolitic species, the *Danæopsis marantacea* and *D. Rumphii*. But, besides these, some stems or very large petioles have been found at Autun, in France, and in the lower Carboniferous beds of Eastern Lancashire, which are certainly Marattiaceous, demonstrating the existence of this peculiar Cryptogam at that early date.

The greater number of the Carboniferous Ferns to which the organs of fructification are found attached belong to a peculiar and now extinct group to which the name of *Botryopterids* has been given; in which portions at least of the fertile fronds have been connected into branching masses of sporangia. But perhaps the most interesting feature connected with these Palæozoic Ferns is the discovery both in the Carboniferous and Devonian strata of representatives of the group of Hymenophyllaceæ or Filmy Ferns. The primitive organization of these Ferns has already been referred to; hence their prevalence in the oldest strata in which ferns have been discovered in any considerable quantities is what the doctrine of Evolution would lead us to expect were we to reason after the *à priori* fashion. There is evidently no reason for doubting that the fine *Palæopteris Hibernica* from the Devonian strata, not only occurs at Kiltorcan and some other places in Ireland, but also in Scotland and in North America. It may be observed that whilst both the Equisetaceæ and the Lycopods of the Palæozoic age became gigantic trees, and hence displayed in the interior of their stems a magnificent exogenous development of their vascular structures unknown amongst their living representatives, the Ferns of the same age, arborescent or otherwise, possessed no such growths. The genera and species are distinct from existing ones, but, except in detailed features of secondary importance, this important group has undergone but little change between the Devonian age and the present time. But that age was not the beginning of their existence. We have already obtained some fragments of Silurian Ferns, but they are too scanty and insignificant to throw much light on the true character of these plants in the Silurian age. A complete Silurian land-flora yet remains to be discovered.

CHEMICAL SOCIETY.

A meeting of this Society was held on February 15, Dr. Gilbert, President, in the chair.

It was announced that a ballot for the election of Fellows would be held at the next meeting (March 1).

The following certificate was read for the first time: W. H. Cameron.

The list of officers as proposed by the Council was read from the chair. Professor G. D. Liveing and Dr. A. Voelcker are proposed as Vice-Presidents instead of Professors J. Dewar and A. V. Harcourt, who retire; in the Council, Professor Dittmar, Dr. W. R. E. Hodgkinson, Messrs. D. Howard and R. Meldola replace Dr. T. E. Thorpe and Messrs. F. D. Brown, J. M. Thomson and W. Thorp.

Drs. Thorne and Hodgkinson and Mr. D. Howard were elected auditors.

The Secretary then read the following papers—

On some Derivatives of Diphenyleneketone Oxide. By A. G. PERKIN.—While preparing the above substance from salicylic acid and acetic anhydride, the presence of a small quantity of another body was detected in the washings; this substance the author has separated as transparent satiny plates containing 75·2 per cent. C., 3·9 per cent. H; its formula has not yet been settled. By the action of a cold mixture of equal parts of nitric and sulphuric acids, and by the action of fuming nitric acid, a nitro body was formed, $C_{13}H_6(NO_2)O_2$; it is very slightly soluble in boiling alcohol and melts at 262° C. By the action of tin and hydrochloric acid on dinitrodiphenyleneketone oxide, suspended in alcohol, a diamido body is produced, $C_{13}H6(NH_2)_2O_2$; it was obtained in flat orange-coloured needles. This base forms a hydrochloride and a platinum salt, which were analysed. Diphenyleneketone oxide dissolves in cold Nordhausen acid unchanged, but on heating the solution and treating with barium carbonate a salt was obtained having the formula $C_{13}H_6O_2Ba(SO_3)_2$. Bromine, when heated in a sealed tube with diphenyleneketone oxide, forms a dibromobody, $C_{13}H_6Br_2O_2$.

On α-ethyl Valerolacton, α-ethyl-β-methyl Valerolacton, and on a Remarkable Decomposition of β-ethylacetosuccinic Ether. By S. YOUNG.—Fittig and Krafft (*Ann.*, 208–71) prepared a heptolacton of unknown constitution. The author, at the suggestion of Professor Fittig, undertook the preparation of a heptolacton of known constitution. A mixture of 10 grams of sodium, 100 grams of alcohol, 58 grams of aceto-acetic ether and 87 grams of α-bromobutyric ether was heated in a water bath for two days. The author could not obtain a product of constant boiling point; about 12 grams of the portion, boiling at 250°–260°, was boiled with twice its weight of 33 per cent. hydrochloric acid. The resulting product was principally α-ethyl-β-acetopropionic acid, which was extracted with ether and the latter distilled off. The residue partially crystallized at low temperatures. A portion was warmed with sodium amalgam, acidified with sulphuric acid and boiled, made alkaline with potassium carbonate, and extracted with ether; the ether extract on distillation gave a residue which eventually, after fractionation, proved to be the lacton boiling at 219·5°. Analysis indicated the formula $C_7H_{12}O_2$, it did not solidify in a mixture of snow and salt. On dissolving this substance in the smallest possible quantity of ice-cold water a clear solution was obtained, which became turbid from 17° up to 90° C. By boiling the lacton with barium hydrate, barium and ethyloxyvalerate was prepared; the silver salt was also obtained and analysed. When either salt is decomposed by an acid a mixture of lacton and oxyacid is formed. On preparing larger quantities of the crystalline acid, which the author calls ketolactonic acid, the distillate at higher temperatures, above 265°, yielded proportionately more crystals than that between 250°–260°, so that the decomposition apparently takes place during distillation and not during saponification. The barium and silver salts of this ketolactonic acid were prepared and analysed. By the action of barium hydrate on ketolactonic acid a derived acid was prepared, the silver salt of which had the composition $C_8H_{10}O_5Ag_2$. Thorne obtained by the saponification of β-ethylacetosuccinic ether, α-ethyl β-acetopropionic acid and ethylsuccinic acid; the author separated in addition this new ketolactonic acid. α-ethyl-β-methylvalerolacton was also prepared by the distillation of β-ethyl acetomethylsuccinic ether. Thorne, by the distillation of α-ethyl-β-acetopropionic acid, obtained an anhydride, which he stated to be insoluble in water. The author has repeated these experiments and obtained the anhydride which is, however, slightly soluble in water. In conclusion, the constitution of ketolactonic acid is discussed.

Dr. Thorne said that he was able to distil the β-ethyl acetosuccinic ether *in vacuo* at 263°–264° without decomposition; as to the anhydride, he had since found that it was slightly soluble in water. At the time he first prepared the substance he had but a very small quantity at his disposal.

The Society then adjourned to March 1, when a ballot for the election of Fellows will be held and the following paper read, "On some Derivatives of the Isomeric $C_{10}H_{14}O$ Phenols," by Dr. Armstrong and E. H. Rennie.

CHEMISTS' ASSISTANTS' ASSOCIATION.

A paper on "Glycerine and its Application to Pharmacy," was read by Mr. F. Harris Alcock, before the members of the above Association on Wednesday evening, January 31.

The author enumerated a long list of substances from the animal, vegetable and mineral world, which were soluble in glycerine. Popular pharmaceutical preparations into which glycerine largely entered were mentioned, and modes of preparation with formulæ given. The chief object of the paper was to bring forward a method of applying the wonderful solvent, antiseptic, preservative and anti-fermentive properties of glycerine, particularly with reference to the manufacture of glyceroles. The process recommended consists in the use of a menstruum of 1 part glycerine mixed with 4 parts distilled water, which has a sp. gr. 1·06. The properly comminuted drug is exhausted by the menstruum (1 oz. requiring 5 fl. ozs. of solvent as a rule) after maceration, by means of percolation, and the displacement fluid used being distilled water. The united products are then evaporated to 1 fluid ounce on the water-bath and the liquid preserved. One fluid drachm contains the soluble active ingredients from 1 drachm of solid. Experiments had been made with gentian, cinchona, sarsa, glycyrrhiza and pepsin, and the products were exhibited as clear, bright, thick, syrupy liquids having in each case the same odour, taste, appearance and general characters as other preparations of the same drugs prepared by the usual official processes.

An interesting and lively discussion followed, in which the President, Secretary, Messrs. W. T. Cooper, jun., Cox, Cracknell, Dodd, Fell, Parkinson and Ramble, took part.

A hearty vote of thanks, proposed by Mr. Packe and seconded by Mr. Winfrey, to the author for his valuable paper terminated a most enjoyable and profitably spent evening.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of this Association was held on Thursday, February 1, 1883. Mr. R. H. Parker, Vice-President, in the chair.

The following "Dispensing Notes" were read by the Secretary in the absence of the author:—

DISPENSING NOTES.

BY WILLIAM JOHNSTON.

No. 1.

In the course of business, a few weeks ago, some—to me—rather remarkable results connected with the dispensing of the following prescription chanced to come under notice. I hope that the description of them may prove of some interest to the members of this Society.

The prescription was:—

Sulphate of Quinine	40 grains.
Tincture of Perchloride of Iron .	80 minims.
Dilute Phosphoric Acid	1 drachm.
Glycerine	4 drachms.
Water	to 8 ounces.

The quinine was shaken up with a little water as usual, and then dissolved by means of the phosphoric acid. On further dilution with water and addition of the tincture of iron, a copious whitish precipitate appeared. The first supposition was that it would be some compound of quinine, but after inquiry and a few experiments, it was found that there was no quinine in it, excepting, perhaps, a trace carried down mechanically.

When a little sulphate of quinine (a proportionate quantity) was dissolved in water by tincture of iron, and the phosphoric acid added last, precipitation did not take place so rapidly, though, after a time, quite as *completely*. In order to discover if the glycerine or spirit had any influence in the reaction, a small quantity of the mixture was prepared in several different ways.

First—Quinine, tincture of iron and phosphoric acid with glycerine; second—the first three with glycerine and spirit; third—with spirit; and fourth—without either glycerine or spirit. In a few days it was found that No. 1—*i.e.*, with glycerine only—had a trifle more precipitate than the others; No. 2 had next most, and so on; No. 4—without the alcohols—having slightly less than the others. The precipitate was thrown down as largely when one or other of the solvents was added to the quinine in solution *in the full quantity* of water.

It was noticed that, on adding either of the solvents in considerable excess of the proportions named, the precipitate was redissolved.

A portion of it was tested and found to be *phosphate of iron.*

An equation to represent the reaction would be:—

$$Fe_2Cl_6 + 2H_3PO_4 = Fe_2 2PO_4 + 6HCl.$$

Apparently, in that particular proportion, the quinine and, to a small extent, the two alcohols have the power of throwing the ferric phosphate out of solution. The quinine especially has that effect, as a subsequent experiment showed.

Three other mixtures were prepared.

The first containing 10 minims B.P. *solution* of ferric perchloride, 7½ minims dilute phosphoric acid, water to 1 ounce.

The second—Solution of perchloride of iron, dilute phosphoric acid, water, with 10 minims of rectified spirit added.

And the third—Solution of the perchloride, dilute phosphoric acid and water, with 5 grains sulphate of quinine added.

After standing a few days, No. 1 remained bright; No. 2 was decidedly cloudy; whilst No. 3 had in it a plentiful precipitate from the beginning, thus, I think, proving that the quinine and spirit have the power just ascribed to them.

The subject is capable of further development, but want of time compels me to abandon the investigation at present.

I may, however, add that of course the mixture was sent out with all the ferric phosphate in it,—the bottle bearing a "shake" label.

No. 2.

Another example of the power that spirit possesses of throwing throwing certain saline bodies out of solution, was observed a few days afterwards. There was brought to be refilled a bottle which had contained the following mixture:—

Phosphate of Soda	4 drachms.
Bicarbonate of Soda	2 drachms.
Aromatic Spirit of Ammonia,	
Comp. Tincture of Gentian, of each	4 drachms.
Water . . . . . to	8 ounces.

When sent out the salts had been quite dissolved and the mixture bright, but now there was a lot of small crystals at the bottom of the bottle. The spirit was at once suspected of being the cause of this and an experiment undertaken in proof.

Four solutions were prepared.

The first had in it:—1 drachm phosphate of soda, ½ drachm bicarbonate of soda, 2 drachms spirit of wine, and water to 2 ounces.

The second—Phosphate of soda, spirit of wine and water.

The third—Phosphate of soda, bicarbonate of soda, and water.

And the fourth—Phosphate of soda and water.

After standing for three or four days in a cold place, Nos. 3 and 4 remained clear, but Nos. 1 and 2 had deposited a mass of oblique rhombic crystals of sodic phosphate, the former especially.

These facts speak for themselves and need little further comment. It cannot be fairly said that Nos. 1 and 2 deposited because there was *less water* in them, as the difference in that respect was only very slight; and, moreover, the ordinary solubility of the phosphate is one in four or five (Royle says *four* and Squire *five*), whereas, in this case there would be at least ten or twelve parts of water available.

This time, instead of fully dissolving the salts, they were reduced to fine powder, *partially* dissolved and the mixture sent with a "shake the bottle" label on. I may further state that, when the empty bottle was returned a second time, it was found that this plan of powdering and partial solution had been much more satisfactory, there being only a very few small crystals left at the bottom.

A vote of thanks was passed to Mr. Johnston.

In the discussion which followed the Chairman, Secretary, Messrs. Elworthy, Giles and Taylor took part.

The Reporter on Physics, Mr. H. Allen, B.Sc., then made a report upon "Secondary Batteries," which will be published in a future number of this Journal.

The Report was copiously illustrated by experiments, and several of the principal secondary batteries were exhibited, including the new Faure-Sellon-Volckmar accumulator, which was shown in working order.

A discussion followed the reading of the Report, in which the Chairman, Secretary, Messrs. Elworthy, Giles, Ince, MacDermott and Taylor took part, after which the meeting adjourned.

At a meeting held Thursday, February 15, the chair was occupied by Mr. H. G. Greenish, Vice-President.

Mr. W. E. Crow read a paper on "Linnæus," of which the following is an abstract:—

The author first alluded to the antecedents of Linnæus, observing that his predecessors had been peasants, although some of them early in the 17th century had followed literary pursuits. It was Nicholas, his father, who first adopted the name Linnæus, a remarkable linden tree, *Tilia Europæa*, growing near the place of their residence, having, it is said, given origin to this surname. After reviewing somewhat in detail the early life of this great naturalist, and pointing out that he had been intended by his parents for the church, Mr. Crow proceeded to mention the incidents connected with his meeting Rothman, Stobæus and others, men whose influence played no inconsiderable part in delineating a character which for ever would be regarded as one of the most remarkable in the annals of botany.

At the age of 22, Linnæus was eking out a most wretched existence, and it was related that he had to depend on chance generosity for a meal, and had even to repair his shoes with folded paper. The author here pointed out that in spite of all his troubles Linnæus still persevered with his studies, and shortly afterwards was discovered by Dr. Celsius, who took him under his pro-

tection and soon recommended him to pupils, by which means his finances were improved, and he was enabled thereby to assume a more creditable appearance. He then mentioned the many incidents connected with his stay at Upsala, his journey through Lapland, etc., and the steps taken by him to obtain his degree in medicine, which latter was effected at Harderwijk, in Holland. He then proceeded to notice the occasion when Linnæus convinced Professor Burman, of Amsterdam, that the cinnamon tree was a species of Laurus, and also alluded to a tradition connected with his visit to England, in which it is related that Linnæus fell on his knees in a rapture on observing the golden bloom of the furze (*Ulex Europæus*) growing on some of the commons near London, especially Putney Heath. After reviewing his visit to Paris and his meeting with Jussieu, the great French botanist, Mr. Crow proceeded to give a brief sketch of the Linnæan or Artificial System of classification.

A diagram was exhibited showing the whole of the twenty-four classes and some of the more important orders, comparing them at the same time with the Natural System. Special attention was called to the following classes:—Icosandria, Polyandria, Didynamia, Tetradynamia, Monadelphia, Syngenesia, Gynandria, Monœcia, Diœcia, etc., and the orders of the Natural System which corresponded with them.

A discussion followed in which the Chairman, Secretary, Messrs. Baily, Corder, Hamilton and Rees took part.

A vote of thanks was passed to Mr. Crow.

The Reporter upon Analytical Chemistry, Mr. C. Thompson, then made a Report upon two new methods for the separation of copper and cadmium. The first method depended upon the fact that copper is precipitated from solution as sulphide by boiling with milk of sulphur, while cadmium remains in solution, the second method depended upon a similar reaction but involved the use of sodium thiosulphate. Mr. Thompson was making experiments upon the processes and promised to give an account of his results at the next meeting.

After a short discussion the meeting adjourned.

SOCIETY OF CHEMICAL INDUSTRY.

The Present Condition of the Soda Industry.

BY WALTER WELDON, F.R.S.

(*Continued from page* 638.)

The other consideration to which I referred as having given comfort to the makers of Leblanc soda, and which constituted indeed their chief ground of hope for salvation against the ammonia process, was that the world requires chlorine as well as soda, and that while the chlorine of the salt decomposed by the Leblanc process is yielded as hydrochloric acid, from which free chlorine can be obtained readily, the chlorine of the salt decomposed by the ammonia process is yielded as a somewhat dilute solution of calcium chloride. It was thought that the ammonia process would eventually even help the existing Leblanc soda-makers, by preventing the further extension of the Leblanc process, and so restricting the production of hydrochloric acid, and thereby at length increasing the value of that body. The ammonia process, no doubt, would have produced that result, and would have produced it by this time, if the supply of hydrochloric acid in this country had not been already so largely in excess of the demand for chlorine products. That demand is always becoming larger, and within the last few years the production of hydrochloric acid has appreciably diminished; but in this country the constantly-increasing stringency of legislative enactments with respect to river and air pollution has compelled so many producers of hydrochloric acid, who would have preferred to throw their acid away, to employ it in the manufacture of chlorine, whether that manufacture were profitable or not, that the selling price of chlorine products has of late years been continually falling, until it is now at a point at which it barely pays their cost. No doubt, if all the other conditions of the problem were to remain as at present, the demand for chlorine products would in time overtake the supply of hydrochloric acid in this country, as it has long since done on the Continent, and the manufacture of chlorine in England would so again become profitable. But the other conditions of the problem are not likely to remain stationary, and both M. Solvay and myself are doing our best to change them.

M. Solvay is proposing to manufacture hydrochloric acid from the residual calcium chloride of the ammonia process. I imagine that he is urged to that course, not merely by a desire to turn that calcium chloride to account, but also by a desire to avoid making too much nuisance. For it must not be supposed that even the ammonia process, when practised on a large scale, is free from nuisance. It certainly does not send into the air any noxious vapours, but it sends into the water-courses very large quantities of calcium chloride, rarely accompanied by less, and often accompanied by much more, than an equivalent quantity of sodium chloride, and very apt to be accompanied also by both calcium carbonate and free lime. Neither calcium chloride nor sodium chloride will do much harm to a river, if sent into it in moderate quantities; but when it comes to sending into a comparatively small stream, far inland, 260 tons of calcium and sodium chlorides per twenty-four hours,—say, about ten tons per hour, night and day, all the year through: and M. Solvay must be doing something very like that at Dombasle,—the matter assumes quite another aspect. I am not myself an angler, but, if I were, I do not think that I should seek for sport immediately below Dombasle.

Be all that, however, as it may, M. Solvay is now erecting at Dombasle apparatus for an industrial trial of a process for obtaining hydrochloric acid from calcium chloride, at which he has been working for many years. The process in question consists in first concentrating by evaporation the mixed solution of calcium and sodium chlorides which is the residual product of the ammonia process; then mixing the concentrated solution with clay, making the mixture into balls and drying those balls; and then heating these balls to redness in a current of steam. This process certainly works, on condition that the temperature employed be sufficiently high, and that the quantity of steam used be largely in excess of the quantity necessary to react upon the calcium chloride. As the resulting mixture of vapour of water and vapour of hydrochloric acid would otherwise give an extremely dilute aqueous acid, M. Solvay proposes to separate from it most of its vapour of water, before condensing its hydrochloric acid, by passing the mixture of the two vapours through a very strong solution of $CaCl_2$, which he finds will absorb most of the steam from such a mixture, allowing the HCl to pass on alone, so that it can afterwards be condensed in the usual way. All this is ingenious, but it can hardly be cheap. Firstly, a solution containing only about 8 per cent. of calcium chloride has to be evaporated, we may say to dryness; then the mixture of $CaCl_2$ and clay has to be maintained at a red heat for a considerable time, in a current of steam; and then the solution of calcium chloride used to separate steam from the resulting mixture of steam and HCl has to be prepared for use again by having all the water which it has absorbed evaporated off from it. To English manufacturers who have more hydrochloric acid than they can use, this process of M. Solvay's will seem little less than ridiculous; but one must remember that it is intended for countries in which the demand for hydrochloric acid exceeds the supply, and in which countries, moreover, chlorine products are protected by import duties. In such countries, one can quite conceive its being commercially practicable; in which case the exportation of chlorine products from England to the Continent is

doomed. I ought to add that M. Solvay expects that the silico-aluminate of calcium which remains after the chlorine of his mixture of calcium chloride and clay has been driven off by steam will be useful as a cement, and will thus help to pay the cost of his hydrochloric acid.

The exportation of chlorine products from England to the Continent is, moreover, threatened in another way. The Continental manufacturers of Leblanc soda, unlike the English manufacturers of Leblanc soda, do not produce enough hydrochloric acid to meet the demand of their respective countries for that acid itself and the products which are made from it. This is partly due to the production of ammonia soda, proportionately to the total production of soda, being so much greater in France and Germany than in this country; and partly to hydrochloric acid being required in those countries for industries which in this country do not exist. Large quantities of chlorine products consequently go to the Continent from this country: our production of hydrochloric acid being still sufficient to enable us to supply not only the total English demand for chlorine, and the total American demand for chlorine, but also an appreciable proportion of the Continental demand for chlorine, and, in addition to all that, to throw a large residue of hydrochloric acid into the North Sea. The Continental Leblanc soda-makers do not like this importation into their respective countries of chlorine products from England; but they can prevent it only in one or other of two ways: either by increasing their production of hydrochloric acid, or by becoming enabled to obtain from a given quantity of hydrochloric acid a larger proportion of free chlorine than is yielded by the process at present in use. Personally, I have for the process at present in use that respect which one always feels for the bridge which has carried one over, but I am well aware that it can by no means be regarded as final. It yields chlorine cheaply; but it yields only one-third of the total chlorine contained in the acid employed, the other two-thirds being lost as calcium chloride. English chlorine manufacturers will regard almost with horror the idea of a new chlorine process, which shall yield in the free state practically the whole of the chlorine contained in the acid employed; but on the Continent there is a demand for such a process,—a demand which will no doubt be lessened, but will by no means be destroyed, by what is being done in France by the Compagnie d'Exploitation,—and I am one of those who have been called upon to endeavour to supply that demand. M. Pechiney is now preparing to make at Salindres a trial on an industrial scale of a process which, I think, will supply it; and by the end of this year he will probably have obtained decisive results.

As regards the English chlorine industry, however, I do not think that its prospects are by any means so gloomy as, from what I have said so far, might at first blush appear. But I think that its salvation will come from an unexpected quarter. I think that our English manufacturers of Leblanc soda will have to cease to devote their hydrochloric acid,—when they do not throw it away,—exclusively to chlorine making. They would, of course, be only too glad to do so, if a means could be furnished them of turning it to account otherwise; but the difficulty hitherto has been as to how to turn it to account otherwise. I believe that that difficulty is about to disappear. I am not free to enter into that matter now, and, indeed, it is not yet ripe for discussion; but I have very great confidence that new applications of hydrochloric acid, admitting of being applied very extensively, at comparatively small expense, are among the things of the immediate future.

As regards soda, the position of the English Leblanc soda-makers is this. They are now working, when not actually at a loss, at least without profit. Until comparatively recently, they supplied the whole of the English demand for soda, the whole of the American demand for soda, and a large part of the Continental demand for soda. Both their home market, however, and their American market have been recently invaded by English-made ammonia soda, and now the manufacture of ammonia soda has begun in the United States themselves, and will have reached there, before the expiration of this year, a scale of 20,000 tons per annum, while a little later on that Belgian soda and copper work of which I spoke will not only have put an end to all export of English soda to Belgium, but will, doubtless, also be sending Leblanc soda to America: as will also, no doubt, the great work which is being built at Marseilles, and, eventually, those other works which are about to be built at others of the French sea-ports. The exportation of English soda to Austria, which has already dwindled to little more than 8000 tons per annum, is expected to cease entirely before the end of the present year, by reason of the increased quantity of ammonia soda which will soon be made in Austria. An increased production of ammonia soda is similarly expected to put an end, almost immediately, to the importation of English soda into Germany, which importation in 1881 was already only two-thirds of what it was in 1879. Russia, moreover, will soon be making for herself at least a portion of the soda she consumes; and France, which country has hitherto been entirely dependent upon England for her supplies of caustic soda, though she has long ceased to take from us any form of soda, will soon be making herself all the caustic soda she requires; for, apart from what may be done by the new company of which I have spoken, M. Solvay is just beginning to make caustic soda at Dombasle, and contemplates making it there on a very extensive scale.

In face of all this, how are the English Leblanc soda-makers to continue to live? For one thing, it is quite certain that they must have cheaper pyrites. The present price of 6*d.* per unit is an artificial price, entirely due to a trade combination; and that price will certainly have to be reduced by at least 50 per cent. That it can be reduced to 3*d.* per unit, and yet leave a very fair profit to the pyrites sellers, I believe there can be no doubt. At the present price of copper, and at 3*d.* per unit for sulphur, pyrites showing 2½ per cent. of copper by Swansea assay would sell for 39*s.* per ton; and, that Spanish pyrites can be delivered to English ports at that price at a fair profit, is, I believe, unquestionable. If, therefore, the existing companies refuse to supply pyrites at that price, they will simply call into existence other companies which will supply it at that price. That the Leblanc soda-makers will thus get their sulphur at a price not exceeding 3*d.* per unit, after the end of next year, when the present combination between the pyrites companies will expire, may be regarded as quite certain.

Pyrites at 3*d.* per unit, however, would by no means bring down the cost of Leblanc soda to that of ammonia soda. Without using any figures which have been given to me privately, there is no difficulty in arriving, very approximately, at the difference between the cost of ammonia soda and that of Leblanc soda, from what is matter of public knowledge with respect to the dividends paid by joint stock companies which make ammonia soda and publish balance-sheets. We learn in this way that, when Leblanc soda is yielding no profit at all, ammonia-soda is yielding fully £1 per ton. As to make a ton of actual sodium carbonate by the Leblanc process does not require more than about 13·5 cwt. of pyrites, reduction of the price of pyrites to 3*d.* per unit would thus reduce the cost of Leblanc soda only by about 7*s.* 9*d.* per ton of actual sodium carbonate.

Seven shillings and ninepence, however, is something; and, as regards the balance of the pound, there are two resources, which together will, I think, be sufficient to turn the tables upon the ammonia process, and make the good old Leblanc process the cheaper of the two.

One of these two resources consists, of course, in sulphur recovery. If sulphur recovery were the only resource,—which, however, happily it is not,—I think it not impossible that the required 12*s.* 3*d.* per ton of sodium carbonate could be gained by it alone. To this end, except

in localities in which there is a demand for sulphuric acid free from arsenic, the sulphur must be recovered, not as sulphuric acid for use again, but as free sulphur, for sale as such. At the general meeting of our Society at Manchester, last July, I explained that, while the Schaffner and Helbig process would yield as sulphuric acid practically the whole of the sulphur of the calcium sulphide contained in the waste treated by it, it would probably yield as free sulphur only four-fifths of the total sulphur contained in the waste as calcium sulphide. Since then, reason has arisen for a very confident hope that the whole of the sulphur of the calcium sulphide contained in the waste may be obtained in the free state: in which case the yield will be almost exactly 6 cwt. of free sulphur per ton of actual sodium carbonate manufactured. If, therefore, one were dependent for that 12*s.* 6*s.* on sulphur recovery alone, the problem would be narrowed to this: Can free sulphur be obtained from alkali-waste at such a cost, and is there a sufficient demand for free sulphur at such a price, that it shall be possible to sell recovered sulphur, in sufficient quantity, at 2*s.* 0½*d.* per cwt., or say 41*s.* per ton, more than the cost of producing it?

To be continued.)

Parliamentary and Law Proceedings.

Prosecution under the 17th Section of the Pharmacy Act, 1868.

At the Borough Police Court, Nottingham, on Tuesday, February 6, before Mr. F. Parsons and Captain Starey, John Alfred Bailey, of 220, Alfred Street Central, was charged with having sold to Alfred Short Wright, Assistant Secretary of the Chemists and Druggists' Trade Association of Great Britain, a certain poison, to wit, "laudanum," the same being a preparation of opium, not labelled with the name of the article, or with the name and address of the seller of the same, contrary to the statute in such case made and provided.

Mr. Henry Glaisyer, solicitor, Birmingham, appeared on behalf of the Chemists and Druggists' Trade Association of Great Britain, and Mr. F. Lees, solicitor, Nottingham, conducted the defence.

Mr. Glaisyer, in opening the case, said this was a summons issued under the 17th section of the Pharmacy Act, 1868, 31 and 32 Vict., chap. 121, which stated "that it shall be unlawful to sell any poison, either by wholesale or retail, unless the box, bottle, vessel, wrapper or cover in which the poison is contained be distinctly labelled with the name of the article, the word 'poison,' and with the name and address of the seller of the poison." The section then proceeded to lay down that any person selling poison otherwise than is herein provided shall, upon a summary conviction before two justices of the peace in England or the sheriff in Scotland, be liable to a penalty not exceeding £5 for the first offence, and £10 for the second or any subsequent offence, and for the purposes of this section, the person on whose behalf any sale is made shall be deemed to be the seller. Mr. Glaisyer further stated that on January 30 last Mr. Alfred Short Wright went to Nottingham, and visited the shop of the defendant at 220, Alfred Street Central, where he purchased a quarter of a pound of linseed meal and one pennyworth of laudanum. The laudanum, on being tested by the purchaser, was found to be a preparation of opium. There could be no doubt whatever that the defendant was the person carrying on the business at the address he had given, as he should be prepared to prove, if necessary, that the defendant paid the rates and taxes of the said premises.

Alfred Short Wright, Assistant Secretary of the Chemists and Druggists' Trade Association of Great Britain, gave evidence as to the purchase of the laudanum, which he said had been supplied to him by a woman. He had examined the contents of the bottle and found it to be a preparation of opium.

William Pilgrim said he was rate collector for the Borough of Nottingham, and produced his rate book, in which the name of John Alfred Bailey appeared as occupier of the premises 220, Alfred Street Central, and that he paid him the rates.

This was the case for the prosecution.

Mr. Lees said he was quite prepared to admit the offence on behalf of his client, and addressed the Bench for mitigation of the fine, admitting that the laudanum had been sold, but not by the defendant. Defendant was preparing to undergo an examination which would enable him to be qualified as a dealer in such drugs. After taking these facts into consideration he trusted the Bench would only inflict a nominal penalty.

The Magistrates said they had carefully considered the matter and thought it was a case that had been taken up very properly for the protection of the public and they had decided to convict defendant in a penalty of £1 11*s.* 6*d.* including costs.

Prosecution of a "Herbalist" under the 17th Section of the Pharmacy Act.

At the Hanley Borough Police Court, on Monday, the 12th inst., John Wheatcroft, carrying on business as a herbalist in Parliament Row, Hanley, was summoned to answer a charge of selling poison without labelling the same, and Edward Davis was summoned that he being in the employ of Wheatcroft did vend the same on the 25th January last.

It appeared that on the day named Mrs. Bratt, a widow, went to the defendant's shop for some burdock root. The defendant Davis was in the shop, and said in reply to a question by Mrs. Bratt that burdock would do a deal of good if mixed with some other herb roots, namely, mezereum, gentian and dandelion. He gave her a paper which he said contained these roots, but on Mrs. Bratt taking a wineglassful of a decoction made from them she became black in the face and delirious.

Evidence was given to the effect that belladonna had been given instead of burdock.

Mrs. Bratt's daughter, who also took two tablespoonfuls of the decoction, became very ill, and was almost blind when she went for the doctor, and was obliged to turn back to get a drink, so great was her thirst.

Wheatcroft was fined £5 and costs, the summons against Davis being dismissed.—*Staffordshire Sentinel.*

Alleged Poisoning by a Patent Medicine.

An adjourned inquest has been held at the Stowmarket County Hall, on the body of Sarah Scurrah, before Mr. A. F. Vulliamy, Coroner.

Dr. W. G. Groome said that he had made a *post-mortem* examination of the deceased and could find no cause of death. Deceased was suffering from no disease that would rapidly cause death. His opinion was that she died from opium poisoning.

Edward Richard Gibbs said he bought the bottle of balsam produced, at his aunt's request, for her at Mr. Martin's shop in the Edgware Road, about four years ago. It was not opened till January 9, last. His aunt wished him to buy it for her, because she had previously found it beneficial. She on that occasion took a teaspoonful of the mixture three times a day. She took three doses of it. This was rather more than four years ago. He did not remember that she felt drowsy on that occasion.

Mr. A. H. Martin, chemist, of South Hampstead, described the constituents of the pectoral balsam. It contained, amongst other things, ½ ounce of crude opium in every 100 ounces. He had been very careful to keep within the limits of the dose ordered by the Pharmacopœia,

which gave ½ a grain to 2 grains of opium as the maximum dose. Crude opium was not so strong as powdered opium, because the latter was deprived of the moisture. He should think one teaspoonful, which contained 6 minims of laudanum, would be absorbed as soon as taken, more especially as it is taken in combination with an alkali. He had sold hundreds of bottles, and had never had an accident. He did not believe that the dose deceased took of his mixture would have caused death.

A verdict of "Accidental death from opium poisoning" was returned.

Charge against an Assistant.

At the Southampton Petty Sessions, Charles Baker was charged on remand with stealing two florins, the property of his employers, the Southampton Drug Company, of 153, High Street.

Mr. William Day, director and secretary of the Company, stated that on January 16, defendant, who was a managing chemist in their employ, was engaged in the shop, his duty being amongst other things to serve customers, and when he took cash over the counter it was his duty to enter it in a book which duplicated the entry by means of a carbon sheet placed between the leaves. He then had to tear out two leaves, and hand one with a billhead to the customer, and the other with the carbon impression to the cashier with the money. This it was alleged he had not done in a case where a purchase had been made with marked money, which was afterwards found in his possession. The prisoner was committed for trial, but was liberated on bail, himself in £100 and two sureties in £50 each.

Charge of Theft against a Chemist's Assistant.

At the Liverpool Police Court, on Wednesday, January 31, Francis Edward Twemlow, was charged with having stolen drugs and chemicals to the value of £150, the property of the Liverpool Apothecaries' Company, Limited, Colquit Street, Liverpool. According to the evidence it appeared that the prisoner had been three months in the service of the prosecutors, and that after he had left their suspicions were excited by information that he had been advertising drugs, etc., for sale at reduced prices. Upon inquiries being made it was found that the prisoner had received two cheques, and when he was arrested drugs were found in his boxes which were identified as the property of the Company. The prisoner was committed for trial, bail being refused. —*Manchester Guardian.*

Obituary.

Notice has been received of the death of the following:—

On the 6th of January, Mr. Albert Charles Muskett, Chemist and Druggist, Park Street, Southwark. Aged 56 years.

On the 20th of January, Mr. John Hawkin, Chemist and Druggist, Bedale, Yorkshire. Aged 78 years.

On the 22nd of January, Mr. James William Barnes, Pharmaceutical Chemist, Spalding, formerly of Oxford Street. Aged 27 years. Mr. Barnes had been a Member of the Pharmaceutical Society since 1881.

On the 25th of January, Mr. Frederick Finney Flint, Chemist and Druggist, Prebend Street, Islington. Aged 44 years.

On the 25th of January, Mr. William Saxe Pearson, Chemist and Druggist, Kidsgrove, Staffordshire. Aged 67 years.

On the 27th of January, Mr. Stephen Bloxwich, Chemist and Druggist, Bloomsbury Street, Birmingham. Aged 65 years.

On the 28th of January, Mr. Charles Patrick Baker, Pharmaceutical Chemist, High Street, Chelmsford. Aged 63 years. Mr. Baker had been a Member of the Pharmaceutical Society since 1850.

On the 2nd of February, Mr. Edwin Pomeroy Webster, Pharmaceutical Chemist, Newcastle-on-Tyne. Aged 60 years. Mr. Webster had been a Member of the Pharmaceutical Society since 1853.

On the 4th of February, Mr. Joseph Dixon, Chemist and Druggist, Whitefriar Gate, Hull. Aged 62 years.

On the 6th of February, Mr. Benjamin Matthew Tippett, Pharmaceutical Chemist, Sloane Street, London. Age 71 years. Mr. Tippett was one of the Founders of the Pharmaceutical Society.

On the 8th of February, Mr. John Martin, Pharmaceutical Chemist, Cleveden, Somerset. Aged 67 years. Mr. Martin also was one of the Founders of the Pharmaceutical Society.

On the 12th of February, Mr. Edward Bruce Oddie Chemist and Druggist, High Street, Bristol. Aged 34 years.

On the 13th of February, Mr. Alexander Maunder, Chemist and Druggist, Weston-super-Marc. Aged 66 years.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Aromatic Spirits of Ammonia.

Sir,—Kindly allow me space to point out an error into which Mr. Martindale fell in criticizing my paper on sal volatile.

To make 7 pints of the official compound without distillation, the 8 oz. amm. carb. must be dissolved in a mixture of 4 oz. liq. amm. ft. and 10 ozs. of water. Mr. Martindale, to disprove my statement that the amm. carb. would not dissolve in the requisite quantity of water, showed an experiment in which he used double this proportion of water.

As for Mr. Schacht's reiterated statement, that after addition of the spirit, in my process "a solution could be obtained without the aid of heat," I do not find in the paper any assertion to the contrary.

The application of heat is recommended because sal volatile made with such a solution does not deposit crystals, even at 0° C., whereas when prepared with a solution effected in the cold, a deposit forms at low temperatures.

Buxton. J. C. Thresh.

Only a Junior.—The answer to your question may be obtained by drying the extracts and observing the reduction in weight through loss of moisture. The equivalent of the dry extract is then ascertainable by calculation.

T. H. Dodd.—Your letter was not published because it did not appear to us that it threw any fresh light upon the subject.

Vibgyor.—There is no contradiction between the two statements. For an account of the ammonia process, see before, p. 455.

E. J.—Your communication was sent to the wrong address. It has now been received.

J. F. L.—(1) A candidate for a Bell Scholarship must be a Registered Student or Apprentice of the Society. (2) No. (3 and 4) No single book would be sufficient for the purpose. (5) We cannot say.

Communications, Letters, etc., have been received from Messrs. Burgoyne, Burbidge and Co., Baldock, Jones, Shirivell, Ince, Pollard, Rouch, Young, Wilkinson, Wade, Hay, Hart, W. Robert, Local Secretary, Only a Junior, Hospital Dispenser, Assistant, Asinus, Minor Associate in Business, Pestle, Nemo, Publishers of *El Sentido Catolico*.

LOCAL LIST OF SUBSCRIPTIONS

TO THE

BENEVOLENT FUND

RECEIVED DURING 1882.

	£	s.	d.
Aberaman.			
Sims, William	0	5	0
Aberayron.			
Jones, John Price	0	2	6
Aberdare.			
Jones, D. W.	0	5	0
Smith, Morgan	0	2	6
Aberdeen.			
Bremner, James	0	5	0
Broomhead, George E.	0	10	0
Coutts, Charles	0	5	0
Cruickshank, Geo. P.	0	5	0
Davidson, Charles	1	1	0
Davidson and Sim	0	10	6
Giles, William	0	5	0
Gordon, William	0	5	0
Johnston, John	0	5	0
Kay, James P.	0	5	0
Kemp, James	0	10	6
McLean, A. L. H.	0	4	6
Paterson and Sons	0	10	6
Presslie, R. D.	0	5	0
Strachan, Alexander	0	5	0
Abergavenny.			
Hollway, A. B.	0	5	0
Abergele.			
Hannah, Charles	0	10	6
Hannah, John	0	5	0
Aberystwith.			
Davies, David	0	5	0
Ellis, Robert	0	2	6
Wynne, Edward P.	0	10	6
Abingdon.			
Ballard, William	0	5	0
Preston, Alfred P.	0	5	0
Roberts, Thomas	0	5	0
Smith, William	0	5	0
Smith, William F.	0	5	0
Aboyne.			
Petrie, James J.	0	5	0
Abridge.			
Windus, Arthur E.	0	5	0
Accrington.			
Sprake, David L.	0	10	6
Stanley, Thomas	0	2	6
Addiscombe.			
Townsend, Charles	0	10	6
Alcester.			
Adcock, Isaac Dickson	0	10	6
Overbury, Henry	0	5	0
Aldershot.			
Williams, James	0	10	6
Alexandria, N.B.			
McFarlane, Peter	0	5	0
Alfreton.			
Robinson, Joseph S.	0	10	6
Alnwick.			
Newbigin, James L.	0	10	6
Newbigin, Lesslie	0		0
Alresford.			
Connor, Thomas H.	0	5	0
Richardson, J. H.	0	2	6
Ambleside.			
Bell, Thomas	0	10	6
Ampthill.			
Allen, George	1	1	0
Andover.			
Gould, Robert G.	0	10	6
Angmering.			
Freeland, Alonzo J.	0	2	6
Freeland, H. W.	0	2	6
Annan.			
Rae, Robert S.	0	10	6
Arbroath.			
Burn, David H.	0	5	0
Ashbourne.			
Bradley, Edwin Sylvester	0	10	6
Greaves, Frederick W.	0	5	0
Osborne, James	0	5	0
Reckless, A. H.	0	10	6
Wardle, Thomas	0	2	6
Ashford (Kent).			
Brothers and Son	1	1	0
Ingall, Joseph	1	1	0
Stedman, William	0	5	0
White, Charles Thomas	0	5	0
Ashton-under-Lyne.			
Arnfield, John C.	0	5	0
Bellfield, William	0	10	0
Bostock, William	0	10	6
Heap, Henry	0	2	6
Knott, E.	0	2	6
Neal, S.	0	2	6
Thatcher, Thomas	0	2	6
Waterhouse, Jabez	0	10	6
Ashwell.			
Skelton, J. H.	0	5	0
Atherstone.			
Orme, William	0	10	6
Atherton.			
Fletcher, Ellis	0	5	0
Heywood, John H.	0	10	6
Warburton, Thomas	0	5	0
Aylesbury.			
Dickins, Rowland	0	5	0
Palmer, Edwin T.	0	5	0
Turner, John	0	5	0
Badsworth (near Pontefract).			
Heald, Samuel H.	0	10	6
Bakewell.			
Carrington, Edward G.	0	5	0
Baldock.			
Bally, Edward F.	0	5	0
Banbury.			
Ball, George V.	0	10	6
Bartlett, H.	0	5	0
Falkner, Richard	0	10	6
Gilkes, W. P.	0	10	6
Watts, W.	0	5	0
Banchory.			
Lunan, Alexander	0	5	0
Bangor.			
Baker, Henry V.	0	10	6
Jones, H. L.	0	5	0
Bangor—continued.			
Jones, Owen	0	5	0
Roberts, Meshach	1	1	0
Webster, Thomas	0	2	6
Barnard Castle.			
Martin, C. B.	0	5	0
Barnstaple.			
Goss, Samuel	0	5	0
Partridge, James	0	5	0
Pratt, Edward	0	5	0
Symons, William	0	5	0
Barrow-in-Furness.			
Bryden, John	0	5	0
Chapman, Leonard P.	0	5	0
Ormandy, John S.	0	5	0
Steel, Thomas	0	5	0
Taylor, Stephen	0	5	0
Barton-on-Humber.			
Crowther, Charles H.	0	10	0
Ingoldby, William	0	2	6
Smith, Richard F.	0	5	0
Basingstoke.			
Sapp, Arkas	0	10	6
Woodman, George	0	5	0
Bath.			
Blagg, Eli	0	2	6
Bright, William	0	5	0
Capper, Edmund	0	5	0
Clarke, B. G.	0	2	6
Commans, Robert D.	0	10	6
Dunn, Richard	0	5	0
Ekin and Appleby	0	10	6
Goodman, D. H.	0	5	0
Griffin, Alfred W.	0	5	0
Hillier, Henry	0	10	6
Hughes, John Edward	0	10	6
Marsh, John H.	0	10	6
Masters, Henry James	0	5	0
Merrikin, John B.	0	10	6
Pinch, James E.	0	5	0
Rickwood, Henry	1	1	0
Thomas, Henry J.	0	10	6
Thring, Edmund J. H.	0	10	6
Tilsley, George	0	10	6
Toone, Joseph V.	0	10	6
Vigis, Joseph L.	0	10	6
Williams, Sophia	0	10	6
Wilson, Joseph	0	5	0
Batley.			
Parrington, William	0	5	0
Beaumaris.			
Slater, John	0	10	6
Bedale.			
Swinbank, J.	0	5	0
Bedford.			
Anthony and Biss	0	10	0
Cameron, William Alexander	0	5	0
Clifford, R. N.	0	5	0
Corrie, A. A.	0	1	0
Corrie, Isabella A.	0	5	0
Cuthbert, J. M.	0	5	0
Ekins, John	0	10	6
Hester, Charles	0	5	0
Jones, George	0	5	0
Norman, Joseph S.	0	5	0
Taylor, J. B.	0	5	0
Thompson, H.	0	5	0

Bedford, Leigh.	£	s.	d.
Haddock, James	0	5	0
Bedlington.			
Foggan, George	0	5	0
Belfast.			
Green, Thomas	0	5	0
Yoxall, Henry	0	5	0
Belper.			
Bowler, William Samuel	0	2	6
Burkinshaw, W. T.	0	5	0
Belvedere.			
Miles, George	0	5	0
Berkeley.			
Bell, Edward Collinson	0	10	6
Berkhamsted.			
Rippon, R. O.	1	1	0
Berwick-on-Tweed.			
Carr, Walter P.	0	5	0
Beverley.			
James, Kirby	0	10	0
Bexley Heath.			
Mason, Alfred J.	0	5	0
Bideford.			
Betty, Samuel C.	0	10	0
Hogg, Thomas	0	5	0
Biggar.			
Eunson, John	0	2	6
Biggleswade.			
Spong, D. M.	0	5	0
Bilston.			
Kearnes, Robert H.	0	5	0
Bingham.			
Doubleday, Frederick	0	5	0
Bingley.			
Hanson, Christopher	0	2	6
Skirrow, William E.	0	10	6
Slicer, Walter	0	7	6
Birkenhead.			
Barber, George	0	10	6
Burroughs, George H.	0	10	6
Dutton, H. O.	0	10	0
Field, H. E.	0	5	0
Fore, Thomas	0	5	0
Foulkes, William James	1	1	0
James, Thomas C	0	5	0
Mullock, Richard	0	10	6
Nicholson, Henry	0	10	6
Stewart, Alexander	0	10	6
Stewart, John	0	10	6
Wilkinson, Samuel	0	5	0
Birmingham.			
Bagshaw, Henry B.	0	10	6
Barker, Thomas	0	10	6
Bird, Alfred	1	1	0
Cattell, John T.	0	2	6
Chase, Thomas, jun.	1	1	0
Churchill, Walter J.	1	1	0
Clayton, Francis Corder	1	1	0
Cornforth, Edwin	0	2	6
Drew, John	0	5	0
Foster, Alfred H.	0	5	0
Foster, James Alfred	0	5	0
Frobisher, Frederick	0	5	0
Goldsmith, Edgar	0	2	6
Holdsworth, Thomas W.	0	10	6
Lucas, Joseph	0	10	6
Mantell, Charles	0	10	6
Mott, John C.	0	5	0
Naish, C. E.	0	10	0
Pegg, Herbert	1	1	0
Perry, George E.	0	5	0
Perry, William Henry	0	5	0
Robinson, Eardley	0	10	6
Snape and Son	0	10	0
Southall Bros. and Barclay	1	1	0
Thomason, Thomas W.	0	2	6
Thompson, William	0	5	0
Turner, Benjamin	0	2	6
Wakefield, John	1	1	0
Wilcox, George	0	10	6
Bishop Auckland.			
Dobinson, Thomas	0	5	0

Bishop Stortford.	£	s.	d.
Hardy, John	0	5	0
Speechly, George	0	10	6
Bishop's Castle.			
Bills, Martha Cam	0	10	6
Blackburn.			
Booth, James	0	10	6
Critchley, T.	0	5	0
Farnworth, William	1	1	0
Garland, A. P.	0	5	0
Hindle, Henry	0	5	0
Hindle, James	0	5	0
Paffard, Frank	0	10	6
Wells, William	0	5	0
Blandford.			
Groves, Mrs. W. E.	1	1	0
Bodmin.			
Williams, Joel D.	1	1	0
Bognor.			
Long, Alfred T.	0	10	6
Bolsover.			
Thornley, Thomas	0	5	0
Bolton.			
Blain, William	0	10	6
Forbes, James W.	0	10	6
Hart, James	0	10	6
Mather, James	0	10	6
Bombay.			
Kemp, D. S.	1	1	0
Bo'ness (N.B.).			
Tweedie, Alexander	0	10	6
Bonnyrigg.			
Hutcheon, W.	0	2	6
Boston (Lincs).			
Allen, Thompson	0	5	0
Cammack, John	0	5	0
Grimble, Albert	0	5	0
Haller, F. W.	0	5	0
Lewin, Edward C.	0	5	0
Pilley, Henry T.	0	5	0
Pilley, Samuel	0	5	0
Boulogne (France).			
Parsons, J. Vincett	0	5	0
Bourne (Lincs).			
Mills, Robert M.	0	10	6
Bournemouth.			
Atkins, John	0	5	0
Beale, J. H. T.	0	5	0
Bennett, Charles	0	2	6
Duncan, Alexander	1	1	0
Endle, Frederick	0	5	0
Gilbert, William	0	2	6
Hazard, James D.	0	5	0
Newbury, Samuel	0	5	0
Parkes, Harry C.	0	2	6
Shemmonds, John	0	5	0
Shipman, John J.	0	10	6
Spinney, Frank	0	10	6
Worth, Edwin	1	1	0
Bourton-on-the-Water.			
Griffin, Henry S.	0	10	6
Bovey Tracey.			
Selleck, W. R.	0	5	0
Bowness-on-Windermere.			
Birkett, Charles	0	5	0
Bradford (Yorks).			
Beanland, Samuel	0	5	0
Bell, Francis	0	10	6
Blackburn, Bailey	2	2	0
Butterworth, Albert	0	10	6
Cocker, Justus J.	0	5	0
Cockshott, William	0	2	6
Faull, John	0	5	0
Harrison, Parkinson and Co.	2	2	0
Lister, Simeon	0	10	6
Rimmington and Sons	2	2	0
Rogerson and Son	2	2	0
Stephenson, Robert	0	5	0
Tempest, Joseph	0	2	6
Watts, John	0	10	6
West, William	0	2	6
Bradford-on-Avon.			
Cooper, Albert H.	0	10	0

Braintree.	£	s.	d.
Row, George C.	0	2	6
Brecon.			
Meredith, John	0	10	6
Bridgend.			
Jenkins, D.	0	5	0
Lloyd, John	0	5	0
Bridgnorth.			
Hughes, Hubert	0	5	0
Steward, William	0	10	6
Bridgwater.			
Basker, J. A	0	5	0
Woodward, John L. L.	0	5	0
Bridlington.			
Jackson, Henry J.	0	10	0
Smith, John	0	2	6
Bridlington Quay.			
Dickins, Mary	0	5	0
Bridport.			
Beach and Barnicott	1	1	0
Beach, James	0	10	6
Jones, Frederick	0	2	6
Brightlingsea.			
Cooper, George B.	0	5	0
Brighton.			
Adams, Frank	0	10	6
Barton, Charles	0	10	6
Barton, Henry	0	10	6
Chambers, Herbert	0	2	6
Chaplin, T. W.	0	5	0
Chapman, F.	0	2	6
Cornish, William	0	5	0
Cox, Arthur H.	1	1	0
Edwards, J.	0	5	0
Else, William	0	10	6
Firman, H. E.	0	2	6
Gibson, W. H.	0	5	0
Glaisyer, Thomas	0	10	6
Grinstead, J.	0	10	0
Gwatkin, James Ross	0	10	6
Hardcastle, S. B.	0	10	6
Harris, E. R.	0	10	0
Harrison, Frederick	0	10	6
Hickley, G.	0	10	6
Hornsby, George G.	0	10	6
Jeeves, Thomas	1	1	0
Knight, Lindsey	0	5	0
Leigh, M.	0	10	6
Long, Henry	0	10	6
Macdonald, D. F.	0	2	6
Metherell, K.	0	10	6
Morgan, Dr.	0	5	0
Oliver, John G.	0	5	0
Padwick, John	0	10	6
Pears, Kilby	0	10	6
Perress, J. C.	0	5	0
Robson, Thomas	0	10	6
Salmon, E. F.	0	2	
Salmon, F. W.	0	10	6
Savage and Son	1	1	0
Smith, Walter Henry	1	1	0
Smithson, J.	0	10	6
Sprackett, W. R. H.	0	5	0
Tench, Richard	1	1	0
Vizer, Edwin B.	1	1	0
Walmsley, Robert	0	5	0
Watts, Charles U.	0	10	6
Brill (Bucks).			
Tottenham and Holmes	0	10	6
Bristol.			
Ackerman, Henry	0	10	6
Ackerman, Theophilus	1	1	0
Allen, Benjamin	0	5	0
Bamfield, John	0	5	0
Bennett, Joseph	0	5	0
Berry, William	1	1	0
Butler, Samuel	1	0	0
Cuff, Robert C.	0	5	0
Dibble, J. W.	0	10	6
Dudden, Richard M.	0	5	0
Freestone, R. H.	0	5	0
Freestone, Thomas M.	0	10	6
Hatch, Richard M.	1	1	0
Hodder, Henry	0	5	0
Howell, Henry	0	5	0
Jones, William W.	1	1	0
Latrobe, Henry	0	5	0
Llewellyn, David	0	2	6
Long, John T.	0	10	6

Bristol—continued.	£	s.	d.
Moore, J. E.	0	5	0
Newman, Robert	0	10	6
Newcombe, William L.	0	2	6
Pitman, John	1	1	0
Plumley, James G.	0	5	0
Schacht, G. F.	1	1	0
Sprackett, G. S.	0	10	6
Spill, Thomas	0	10	6
Stewart, James	0	10	6
Stroud, John	0	10	6
Thomas, John D. D.	0	10	6
Towerzey, Alexander	0	10	6
Townsend, Charles	1	1	0
Troake, R. J.	1	1	0
Turner, W. H.	0	2	6
Wade, Thomas T.	0	2	6
Watson. E. M.	1	1	0
Weeks, Albert J. J.	1	1	0
White, James W.	0	10	6
Wretts, John R.	0	10	6
Briton Ferry.			
Jones, Morgan H.	0	5	0
Olive, W. T.	0	5	0
Bromley (Kent).			
Mussellwhite, W.	0	2	6
Shillcock, George	0	5	0
Shillcock, Joseph B.	0	10	6
Skinner, Richard	0	5	0
Brompton, Old.			
Dadford, Thomas	0	5	0
Stokes, Walter E.	0	10	6
Brynmawr.			
Evans, Alfred E.	0	5	0
Jones, Alfred M.	0	10	6
Buckingham.			
Kingerlee, George	0	10	6
Builth.			
Williams, Moses	0	5	0
Burgess Hill.			
Kemp, John	0	10	6
Burnham (Bucks).			
Heald, Alfred	0	10	6
Burnham (Essex).			
Ellis, William	0	5	0
Burnham Market.			
Spencer, William Henry	0	5	0
Burnley.			
Barlow, Joseph A.	0	2	6
Cowgill, Brian H.	0	10	6
Heaton, Martha	0	2	6
Hitchin, Robert	0	5	0
Holden, John	0	2	6
Parkinson, Josiah	0	2	6
Parkinson, William	0	5	0
Smith, James Jeremiah	0	2	6
Wright, John W.	0	5	0
Burntisland.			
Gilmour, Andrew	0	5	0
Burslem.			
Blackshaw Thomas	0	10	6
Guest, George C.	0	2	6
Leicester, Thomas	0	10	6
Oldham, William	0	10	6
Burton-on-Trent.			
Green, Isaac	0	5	0
Ottey, Thomas	0	5	0
Wright, George	0	10	6
Bury St. Edmunds.			
Last, A. J.	0	2	6
Summers, Frank	0	5	0
Youngman, Edward	0	2	6
Buxton (Derbyshire).			
Ashton, George	0	1	0
Bottomley, S. W.	0	2	6
Thresh, Arthur	0	2	6
Thresh, John C.	1	1	0
Wilson, H.	0	1	0
Caistor.			
Levick, George A.	0	4	0

Cambridge.	£	s.	d.
Beall, George	0	5	0
Church, H. J.	0	10	0
Deck, Arthur	0	10	0
Field, Ebenezer	0	5	0
Hoare, W. P	0	5	0
Pain, Walter E.	0	5	0
Pearse, John	0	5	0
Throssel, John	0	5	0
Yeomans, John	0	5	0
Canterbury.			
Amos, Daniel	0	10	6
Biggleston, E. R.	0	5	0
Bing, Edwin	0	10	6
Cooper, J. R.	0	5	0
Thomas James	0	5	0
Cardiff.			
Anthony, David	0	5	0
Coleman, E. J.	0	10	6
Collier, J. A.	0	2	6
Drane, Robert	0	10	6
Greaves, John	0	5	0
Howell, Thomas	0	5	0
Mumford, Richard	0	5	0
Munday, John	0	5	0
Williams, Thomas	0	10	6
Williamson, J. E.	0	5	0
Carlisle.			
Bell, John	0	5	0
Fisher, Catherine Hodgson	0	5	0
Foster, James	0	5	0
Hallaway, John	0	5	0
Parker, William	0	5	0
Richardson, Thomas J.	0	2	6
Robson, John	0	5	0
Thompson, Andrew	0	10	6
Todd, Joe	0	5	0
Carluke.			
Hinksman, John	0	5	0
Carmarthen.			
Davies, Richard Morgan	0	5	0
Smith, John H.	0	5	0
Carnarvon.			
Jones, John	0	5	0
Lloyd, William	0	5	0
Carnforth.			
Woolstencroft, John	0	5	0
Carrickmacross.			
Strachan, Thomas C.	0	5	0
Carshalton.			
Carter, Francis	0	10	6
Castle Cary.			
Green, William J.	0	10	6
Castle Douglas.			
Veitch, A.	0	5	0
Castle Hedingham.			
Foulsham. H. B.	0	5	0
Chapel Allerton.			
Saville, William	0	5	0
Chard.			
Churchouse, W. B.	0	5	0
Woodland, W. F.	0	5	0
Charlestown-of-Aberlour.			
Smith, John	0	2	6
Chatham.			
Crofts, Holmes C.	0	10	6
French, Miss	0	10	6
Lamb, Thomas C.	0	5	0
Thompson, George Alfred	0	5	0
Tribe, John	0	10	6
Chelmsford.			
Baker, Charles P.	0	10	6
Baker, Gerrad	0	10	6
Metcalfe, Wilson	0	10	6
Tomlinson, James	0	10	6
Cheltenham.			
Balcomb, John	0	10	0
Barron, William	0	10	0
Beetham, William C.	0	10	0
Board, Thomas F.	0	5	0
Butcher, Thomas	1	1	0
Dolman, William	0	5	0
Fletcher and Palmer	1	1	0
Flooks, George	0	5	0

Cheltenham—continued.	£	s.	d.
Hands, William	0	5	0
Hill, Arthur	0	5	0
Jeffrey, Thomas A.	0	10	0
Mansbridge, M. C.	0	5	0
Moore, Edward	0	2	6
Pattison, Thomas	0	10	6
Power, J. H.	0	5	0
Prockter and Forth	1	1	0
Purnell, Henry A.	0	5	0
Seys, Frederick A.	0	2	6
Shaw, Alexander H.	1	1	0
Smith, Nathaniel and Co.	1	1	0
Smith, William H.	0	5	0
Stratton, William	1	1	0
Toone, John A.	0	10	0
Waite, Joseph	0	10	0
Walters, John	0	5	0
Wilkins, Henry	0	5	0
Wilson, John S.	0	5	0
Wood, Frederick	0	5	0
Woodward, Solomon	0	5	0
Chepstow.			
Tame, Thomas	0	2	6
Chertsey.			
Boyce, George	0	5	0
Chester.			
Baxter, George	0	10	6
Grindley and Son	0	10	6
Hodges, William	0	10	6
Hope, John	0	5	0
Huke, James W.	0	5	0
Mills, John	0	5	0
Shrubsole, G. W.	0	5	0
Chester-le-Street.			
Longbotham, Joseph	0	5	0
Chesterfield.			
Barfoot, J. R. D.	0	2	6
Booth, George	0	10	6
Elliott, Thomas	0	5	0
Furness, Thomas	0	2	6
Greaves, A. W.	0	5	0
Greaves, Wm. S.	0	10	6
Lancaster, Wm. G.	0	5	0
Lowe, A.	0	5	0
Sampson, George	0	2	6
Windle, John T	0	5	0
Chew-Magna.			
Milton, Thomas	0	5	0
Chichester.			
Baker and Son	0	10	6
Batchelor, C. J. H.	0	5	0
Elildge, John W.	0	5	0
Chippenham.			
Coles, John C.	0	10	6
Chipping Ongar.			
Chapman, Richard J.	0	10	6
Ward, David	0	10	6
Chipping Sodbury.			
Jones, Richard	0	10	6
Chislehurst.			
Wing, Lewis	0	10	6
Christchurch.			
Green, John	0	5	0
Chulmleigh.			
Joint, Robert James	0	6	0
Cirencester.			
Griffiths, Waldron	0	10	6
Smith, Charles S.	1	1	0
Claycross.			
Lloyd, Robert	0	10	6
Smith, John	0	5	0
Clevedon.			
Evans, Evan J.	0	5	0
Cockermouth.			
Bowerbank, Joseph	1	1	0
Cooper Brothers	0	2	6
Robinson, William	0	5	0
Straughton, Joseph	0	5	0
Codnor (near Derby).			
Farnsworth. Thomas	0	5	0

Colchester.	£	s.	d.
Bates, Thomas W.	0	5	0
Cole, Fred A.	0	5	0
Cordley, W. B.	0	5	0
Hammerton, Edward	0	5	0
Prosser, Mrs.	0	5	0
Shenstone. J. C.	0	5	0
Simpson, Hales	0	5	0
Weddell, Arthur	0	5	0
Congleton.			
Barlow, G. R.	0	2	6
Cole, Frederick	0	5	0
Goode, Charles	0	5	0
Corris.			
Thomas, Maurice	0	5	0
Corwen.			
Jones, William	0	10	6
Coventry.			
Hinds, James	0	10	6
Wyleys and Co.	1	1	0
Cowbridge.			
Thomas, John	0	5	0
Cowes (Isle of Wight).			
Beavan, George A.	0	10	0
Fennings, Alfred	1	0	0
Cradley Heath.			
Bishop and Wooldridge	0	10	6
Cranbrook.			
Turner, John	0	5	0
Crawley.			
Leach, John	0	5	0
Webb, W. J.	0	5	0
Weedon, Joseph	0	5	0
Crediton.			
Jackson, William	1	1	0
Crewe.			
Bayley, William	0	10	6
Harrop, William H.	0	5	0
Crewkerne.			
Catford, O. W.	0	5	0
Cromer.			
Priest, Edward R.	0	10	6
Croydon.			
Clarke, Josiah	0	10	6
Harwood, Charles	0	5	0
Long, Henry	0	10	6
Padwick, W. G.	0	5	0
Roberts, D. P.	0	10	6
Stannard, Frederick John	0	10	6
Croyston (Lancs.).			
Hackforth, Matthew	0	5	0
Cullen, N.B.			
Seivwright, George	0	5	0
Dalton-in-Furness.			
Preston, William L.	0	5	0
Darlington,			
Best, George	0	5	0
Best, J. W.	0	5	0
Coatsworth, Thomas	0	5	0
Cranston, John	0	10	0
Raw, James H.	0	5	0
Robinson, James	0	5	0
Swenden, James	1	1	0
Dartford.			
Cottingham, Joseph J.	0	5	0
Wilson, R. E.	0	2	6
Dartmouth.			
Humphry, Horatio	0	10	6
Rees, William H.	0	5	0
Deal.			
Green, John	0	10	6
Denbigh.			
Edwards, William	0	5	0
Denton (Lancs).			
Arrandale, William	0	10	6

Derby.	£	s.	d.
Bishop, E. J.	0	2	6
Blunt, W. B.	0	5	0
Clifton, Frederick	0	10	6
Cope, J. A.	0	5	0
Dickinson, David	0	2	6
Frost, George	0	10	6
Goodall, Henry	0	5	0
Monkhouse, Henry	0	5	0
Nicklinson, Thomas	0	5	0
Scholes, James S.	0	5	0
Stevenson, Richard W.	0	5	0
Devizes.			
Clark, Robert	0	10	6
Edwards, T. R.	0	2	6
Devonport.			
Codd, Francis	0	5	0
Kent, B. J.	0	5	0
Lamble, John A.	0	2	6
Dewsbury.			
Fryer, John	0	10	6
Walker, George	0	5	0
Didcot (Berks).			
Sadgrove, Arthur A.	0	5	0
Didsbury.			
Bates, John F.	0	5	0
Richardson, Allen	0	5	0
Diss.			
Cadge, John	0	5	0
Cupiss, Francis	0	10	6
Gostling, T. P.	0	10	6
Muskett, Charles	0	5	0
Notcutt, S. B.	0	5	0
Thrower, Edward A.	0	10	6
Whitrod, H. F.	0	5	0
Doncaster.			
Atkinson, Stephen	0	10	6
Cocking, Charles	0	5	0
Cocks, W. J.	0	2	6
Dunhill and Stiles	1	1	0
Hopper, Charles	0	10	0
Hough, William	0	5	0
Howorth, James	0	10	6
Pickering, John	0	5	0
Shaw, H. W.	0	5	0
Walker, E. H.	0	10	0
Dorchester.			
Durden, H.	0	5	0
Evans, Alfred J.	0	5	0
How, William	0	5	0
Pearce, William L.	0	5	0
Watts, E. P.	0	5	0
Dorking.			
Clark, W. W.	0	10	6
Clift, Joseph	0	10	6
Douglas (Isle of Man).			
Brearey, A. W.	0	5	0
Brearey, Wm. A.	1	1	0
Gore. J. R. A.	0	5	0
Dover.			
Adams, R. W.	0	5	0
Barnes, William James	0	5	0
Bolton, J.	0	5	0
Bottle, Alexander	1	1	0
Brown, Joseph Fred.	1	1	0
Cotterell, W. H.	0	5	0
Dickeson, Richard	1	1	0
Ewell, Richard M.	0	5	0
Forster, Robert Henry	0	10	6
Hambrook, John Barber	0	5	0
Peake, Henry	0	10	6
Thompson, Edward	0	10	0
Wilford, Josiah	0	2	6
Wyles, William	1	1	0
Driffield.			
Bordass, James	0	5	0
Parkinson, Thomas	0	5	0
Droitwich.			
Sandiland, R. B., jun.	0	5	0
Dublin.			
Bowles, Charles A.	0	10	6
Scott, Walter	0	5	0
Dudley.			
Green, William	0	2	6
Hollier, Elliott	0	10	6
Thompson, John W.	0	10	6

Dufftown (N.B.).	£	s.	d.
Sangster, William	0	5	0
Dumbarton.			
Babtie, John	0	5	0
Campbell, Colin	0	5	0
Dumfries.			
Allan, William	0	10	6
Dundee.			
McMillan, James	0	10	6
Dunfermline.			
Seath, Alexander	0	10	6
Dunse.			
Veitch, James	0	10	6
Durham.			
Bowman, S.	0	2	6
Burdon, John	0	10	6
Burn, B. P.	0	2	6
Castle, John W.	0	2	6
Greenwell, Richard Henry	0	10	6
Leighton, Mrs	0	10	6
Longman, John Ham	0	2	6
Palmer, John G.	0	2	6
Rollin, John G.	0	10	6
Sarsfield, John	0	2	6
Sarsfield, William	0	10	6
Scawin and Burn	0	10	6
Stangroom, Alfred	0	2	6
Ealing.			
Barry, Thomas S.	0	10	6
Hayles Brothers	1	1	0
Earlstown.			
Peake, Arthur	0	5	0
Eastbourne.			
Crook, Herbert	0	10	6
Cullingford, L. J.	1	1	0
Gibbs, Joseph	0	10	6
Hall, Samuel	1	1	0
East Dereham.			
Smith, William	0	5	0
East Grinstead.			
Dixon, W. H.	0	2	6
East London (Cape Colony).			
Clapton, John	1	1	0
East Retford.			
Clater, Francis	0	10	6
Eastwood.			
Cherrington, B.	0	10	6
Eccleshall.			
Smith, Edgar R.	0	5	0
Edinburgh.			
Aitken, James	0	5	0
Aitken, Robert	0	5	0
Aitken, William	0	5	0
Arthur, Charles	0	2	6
Baildon, Henry B.	1	1	0
Boa, Peter	0	5	0
Brown, J. J.	0	10	6
Brown, Robert	0	5	0
Brown, Robert S.	0	5	0
Bruce, Alexander G.	0	5	0
Buchanan, James	1	1	0
Cairnie, Robert	0	2	6
Chemists' Assistants' Association	1	1	0
Clark, William Inglis	0	10	6
Coates, Edwin	0	10	0
Cowie, George	0	3	0
Dick, Robert	1	1	0
Dick, Robert Gibson	0	5	0
Dott, David B.	0	5	0
Easton, John	0	2	6
Ewing, James L.	0	10	0
Fairgrieve, Thomas	0	10	6
Forret, John A.	0	5	0
Fraser, J. I.	0	5	0
Gamley, David	0	5	0
Gardner and Ainslie	1	1	0
Gilmour, William	1	1	0
Gorrie, Daniel	0	5	0
Gray, E. H.	0	2	6
Gunn, Alexander	0	5	0
Hannay, L. W. C.	0	10	0
Heron, James	1	1	0
Kennedy, Adam	0	10	6
King, William	0	2	6
Laird, George H.	0	5	0

Edinburgh—continued.	£	s.	d.
Leitch, William	0	10	0
Leith, James	0	5	0
Linton, R. T.	0	10	6
Lockerbie, James	0	5	0
MacCullum, A. I.	0	5	0
McCullock, Thomas	0	10	6
Macdonald, Alexander	0	2	6
Macdonald, John	0	5	0
McDougall, R. I.	0	2	6
MacEwan, Peter	0	5	0
Macfarlan and Co.	2	2	0
Macfarlane, Andrew Y.	0	7	6
McGlashan, Duncan	0	10	6
McGlashan, J.	0	10	6
Mackay, George D.	1	1	0
Mackenzie, James	0	10	6
Maclagan, James	0	5	0
MacLaren, David	0	5	0
McPherson, Colin A.	0	5	0
Marshall, James	0	2	6
Napier, Alexander	0	10	6
Noble, Alexander	1	1	0
Pinkerton, William	0	10	6
Prentice, John	0	5	0
Purves, Samuel	0	5	0
Radford, George	0	5	0
Raimes, Blanshard and Co.	2	2	0
Ritchie, J.	0	5	0
Robertson, J.	0	5	0
Robertson and Co.	1	1	0
Scobie, James	0	5	0
Scott, James	0	10	6
Smiles, James	0	5	0
Smith, Thomas	1	1	0
Smith, William	0	5	0
Spence, William	0	5	0
Stephenson, Frederick	0	5	0
Stephenson, J. B.	0	10	6
Stoddart, T. G.	1	0	0
Symington, Thomas	0	5	0
Thomson, Robert	0	10	0
Welsh, Thomas	0	5	0
Wilson, James M.	0	5	0
Wylie, David N.	0	5	0

Edmonton.

Ragg, William	1	1	0
Ragg, William W.	0	5	0

Egham.

Bartholomew, William	0	10	0

Elgin.

Robertson, William	0	5	0

Ely.

Lincoln, William	0	5	0
Pate, Henry T.	0	10	6

Empingham.

Johnson, F. E.	0	5	0

Emsworth.

Sangster, John G.	0	5	0
Waters, Henry Griffith	0	10	6
Waters, William A.	0	5	0

Epping.

Rowland, Thos.	0	10	6

Epsom.

Oxley, Frederic	0	5	0

Evesham.

Dingley, R. L.	0	5	0
Pumphrey, John and Son	0	5	0

Exeter.

Bard, Jane	0	2	6
Brailey, Charles	0	5	0
Bromfield, Charles	0	5	0
Bulley, William H.	0	2	6
Butland, Charles	0	5	0
Cooper, George	0	10	6
Delves, George	0	10	6
Fouraker, Thomas E.	0	5	0
Gadd, Henry	0	10	6
Harris, Henry W.	0	10	6
Hunt, Arthur	0	10	6
Lake, John H.	0	10	6
Milton, Thomas C.	0	5	0
Napier, George L.	0	5	0
Pasmore, George	0	5	0
Sanders, W. F.	0	2	6
Stone, Frederick W.	0	10	6
Tighe, Henry W.	0	5	0
Topham, John Samuel	0	10	6

Eye.

Bishop, Robert	0	10	6

Eynsham.

Howe, Henry A.	0	5	0

Falkirk.

Beeby, John	0	2	6
Murdoch, David	0	10	6

Falmouth.

Newman, Walter F.	0	5	0
Solomon, W. H.	0	10	6

Fareham.

Batchelor, Alfred E.	0	5	0
Batchelor, Charles	0	5	0
Franklin, Alfred	0	5	0

Faringdon.

Ballard, Arthur	0	10	6

Farnham.

Griffiths, J.	0	10	6

Fenton.

Massey, Stephen	0	5	0

Filey.

Robson, John Binnington	0	5	0

Fishguard.

Vaughan, William	0	2	6

Flint.

Jones, Michael	0	5	0
Jones, O. W.	0	5	0

Folkestone.

Giles, John J.	0	10	6
Goodliffe, George	0	10	6
Lea, John	0	10	6
Stainer, John	0	10	6

Fordingbridge.

Haydon, Frederick W.	0	5	0

Forfar.

Ranken, James A.	0	5	0

Fraserburgh.

Burnett, Robert	0	5	0
McDonald, James	0	10	0

Freshwater (Isle of Wight).

Wellington, Henry A.	0	5	0

Friockheim, N.B.

Glass, W. S.	0	2	6

Gainsborough.

Forrest, Richard Wm.	0	10	6
Marshall, John Ferris	0	10	6

Galashiels.

Noble, Alexander	0	5	0
Ross, William	0	5	0

Garston.

Lloyd, T. E.	0	5	0

Gateshead-on-Tyne.

Clarke, T. W.	0	5	0
Elliott, Robert	0	10	6
Greenwell, William C.	0	5	0
Prosser, Thos. W.	0	2	6
Smith, E. B.	0	2	6

Georgetown (Demerara).

Courtenay, Alexander	0	10	6

Gedney.

Harrison, William	0	5	0

Glasgow.

Adams, John	0	10	6
Brodie, Robert	0	5	0
Clarke, Joseph A.	0	5	0
Crocher, Joseph	0	5	0
Currie, John	0	5	0
Currie, William L.	0	5	0
Davison, Thomas	0	10	6
Dickie, James	0	5	0
Fenwick, John	0	5	0
Flint, C. B.	0	10	6
Foster, John	0	5	0
Frazer, Daniel	1	1	0
Gairy, George	0	2	6
Glasgow Apothecaries' Co.	1	1	0
Glen, Robert	0	5	0
Greig, William	0	10	6
Henderson, John	0	5	0
Illingworth, George S.	0	5	0

Glasgow—continued.	£	s.	d.
Jaap, John	0	10	6
Kinninmont, Alexander	0	10	6
Kitchen, James	0	2	6
Laing, James	0	2	6
Lambie, Hugh	0	5	0
Lawrence, John	0	10	6
McMillan, John	0	10	6
McNichol, John	0	5	0
Moir, James	0	5	0
Murdoch Brothers	0	10	6
Paris, Walter	0	5	0
Rose, Alexander	0	10	6
Simpson, William	0	5	0
Twaddle, Robert	0	5	0
Wallace, William	0	10	6
Ward, William A.	0	5	0
Whitelaw, James	1	1	0

Glass (N.B.).

Aberdein, James	0	1	0

Gloucester.

Berry, Edward	0	5	0
Franklin, James	0	5	0
Hughes, Evan G.	0	5	0
Jenkins, Henry	0	5	0
Meadows, Henry	0	10	6
Sadleir, John	0	10	6
Stafford, William	0	10	6
Trotman, A. C.	1	1	0

Gorleston.

Thurlby, George	0	5	0

Gorton.

Plant, Frank G. L.	0	5	0

Gosforth.

Gaitskell, James	0	5	0

Gosport.

French, Benjamin	0	10	6
Hunter, John	0	10	6
Mason, Philip H.	1	1	0
Mumby, Charles	0	10	6
Mumby, Charles J. E.	0	10	6
Smith, W. B.	0	5	0

Govan.

Dunlop, Thomas	0	5	0
Skinner, John	0	5	0

Graaff Reinet (Cape Colony).

Tebb, Henry	1	1	0

Grantham.

Cooper, H. G.	0	5	0
Gibson, John B.	0	10	0
Hall, R. A.	0	10	6
Lynn, J. R.	0	2	6
Stewart, James	0	2	6

Grantown (N.B.).

Duncan, William	0	2	6

Gravesend.

Bulgin, William	0	5	0
Clarke, Richard F.	0	5	0
Lucas, Joseph M. M.	0	5	0
Mitchell, Mrs.	0	2	6
Spencer, Charles	1	1	0

Great Bedwyn.

Gerard, George R.	0	10	6

Great Grimsby.

Mason, William D.	0	2	6

Great Malvern.

Metcalfe, Edmund Henry	0	10	6

Great Warley.

Hayes, James	0	5	0

Greenhithe.

Cox, Edwin J.		5	0

Greenock.

McNeilage, Alexr.	0	2	6

Guernsey.

Arnold, Adolphus	0	10	6
Cumber, Henry	0	2	6

Guildford.

Burton, William	0	5	0
Doubleday, F. W.	0	2	6
Jefferies, Henry	2	2	0
Martin, Edward W.	0	10	6
Thompson, Thomas	0	5	0
Wheeler, Frederick	0	5	0

Guisborough.	£	s.	d.
Fairburn, Robert W.	0	5	0
Haddington.			
Mather, Ellen	0	5	0
Watt, James	0	5	0
Hailsham.			
Jenner, Charles U.	0	5	0
Halesworth.			
Gostling, John H.	0	5	0
Halifax.			
Brook, Robert	0	10	6
Cobb, George M.	0	5	0
Dyer, William	0	5	0
Farr, James	0	10	6
Jessop, Jonathan	0	5	0
Swire, Jabez	0	5	0
Halstead.			
Hoddy, Benjamin	0	2	6
Hampton.			
Shawyer, John J.	0	5	0
Hampton-in-Arden.			
Ratheram, William	0	5	0
Hampton-Wick.			
Watts, John T.	0	2	6
Hanley.			
Insull, E. S.	0	2	6
Jones Edmund	0	10	0
Moore, John William	0	5	0
Smith, Arthur H.	0	10	6
Tirrell, John	0	5	0
Harleston.			
Muskett, James	0	10	0
Woods, Charles	0	5	0
Harrogate.			
Broomfield, R. W.	0	5	0
Coupland, Joseph	0	10	6
Davis, Richard H.	0	10	6
Greenwood, Charles	0	10	6
Greenwood, John	0	10	6
Mather, J. H.	0	5	0
Taylor, Joseph H.	0	10	6
Hartland.			
Cole, Samuel John	0	2	6
Hartlepool.			
Emmerson, C.	0	10	6
Hill, J.	0	10	6
Jackson, William George	1	1	0
Pattrick, George	0	10	6
Harwich.			
Bevan, Charles F.	0	10	6
Bevan, William	0	5	0
Harding, Joseph	0	5	0
Worts, Augustine	0	5	0
Haslingden.			
Blayney, Joseph J.	0	5	0
Hastings.			
Amoore, Charles	0	5	0
Beck, Albert N.	0	5	0
Bell, J. A.	0	10	6
Bolton, Thomas	0	5	0
Jameson, W. E.	1	1	0
Kernot, Dr. G. C.	0	10	6
Mackenzie, Chas. A.	0	5	0
Richards, James G.	0	10	6
Rossiter, Frederick	0	5	0
Snowdon, Robert	0	5	0
Tottle, Henry J.	0	5	0
Haverfordwest.			
Davies, John	0	2	6
Jenkins, Jabez	0	5	0
Saunders, Charles P.	0	5	0
Saunders, David P.	0	10	6
Hawick.			
Blaine T. J. S.	0	2	6
Craig, John	0	5	0
Maben, Thomas	0	5	0
Ross, William R.	0	5	0
Hawkhurst.			
Corke, Edward	0	10	6
Pridgeon, W. J.	0	5	0
Hay.			
Davies, John Lutwiche	0	5	0

Hayhead (near Walsall).	£	s.	d.
Allen, Frederick C.	0	2	6
Hayward's Heath.			
Watts, Edward	0	5	0
Hebburn.			
Puttuck, Fredk. W.	0	4	0
Hebden Bridge.			
Hey, David	0	10	6
Hey, Thomas K.	0	10	6
Lawton, John D.	0	5	0
Heckington.			
Sumners, Michael Cole	0	5	0
Heckmondwike.			
Booth, John	1	1	0
Stephenson, James N.	0	5	0
Helensburgh.			
Harvie, George	0	5	0
Helmsdale.			
Fraser, John	0	2	6
Helston.			
Wakeham, Charles	0	5	0
Hemel Hempstead.			
Argue, James	0	5	0
Henley-on-Thames.			
Hunn, Benjamin	0	5	0
Hereford.			
Chave, William F.	0	10	6
Dillon, F. R.	0	5	0
Guy, E.	0	5	0
Jackson, J. J.	0	10	6
Walker, John	0	10	6
Williams, W. and H. B.	0	10	6
Hertford.			
Aldridge, J. H.	0	5	0
Wilshaw, Samuel T.	0	10	6
Hexham.			
Gibson, J. P.	1	1	0
Richardson, George	0	5	0
Riddle, W. R.	0	5	0
Heywood.			
Beckett, William	0	10	6
Mills, W. H.	0	5	0
Hirwain.			
Sims, Joseph	0	10	6
Hitchin.			
Perks and Llewellyn	1	1	0
Hoddesdon.			
Green, William G.	0	5	0
Whitmore, W. F.	0	2	6
Honiton.			
Turner, George	0	10	6
Hong-Kong.			
Woolnough, H. A.	0	10	6
Horley.			
Philp, Joseph	0	10	6
Horncastle.			
Betts, William	0	5	0
Carlton, E. P.	0	5	0
Horndean.			
Bettsworth, Henry T.	0	5	0
Horsforth.			
Wynn, Frederick	0	10	6
Horsham.			
Williams, Philip	1	1	0
Huddersfield.			
Higgins, Tom Sellers	0	10	6
Kaye, Hamor	0	5	0
King, William	0	10	6
Swift, C. H.	0	5	0
Sykes, Henry	0	5	0
Wheatley, Charles W.	0	10	0
Hull.			
Allison, E. and H.	1	1	0
Baynes, James	0	15	6
Bell, Charles B.	1	1	0
Bousfield, —	0	5	0
Campbell, Charles	0	5	0

Hull—continued.	£	s.	d.
Chapman, E.	0	5	0
Chapman, Joseph	0	2	6
Creasser, Matthew	0	5	0
Desforge, J. H.	0	5	0
Dixon, Joseph	0	10	0
Dobson, J. B.	0	5	0
Dunlop, J.	0	5	0
Dyson, George	0	5	0
Earle, Francis	1	1	0
Fowler, Edwin	0	5	0
Gibson, C. P. (Trustees of)	0	5	0
Goldsmith, William	0	5	0
Gregory, Mrs.	0	2	6
Grindell, John	0	10	6
Hall, Henry R. F.	0	5	0
Hammond, William H.	0	5	0
Hart, George William	0	10	6
Hay, W.	0	2	6
Hebblethwaite, G. A.	0	2	6
Hollingsworth, James	0	5	0
Holmes, J. W.	0	2	6
Howe, H. M.	0	2	6
Hoyles, George	0	2	6
Kellington, M. L.	0	10	6
Linford, John S.	1	1	0
Lofthouse and Saltmer	1	1	0
Loten, W. L.	0	5	0
Milner, John G.	0	5	0
Myers and Saunders	0	10	6
Parsons H. J.	0	5	0
Shaw, Ward	0	5	0
Shepherdson, Welburn	0	10	6
Snape, E.	0	5	0
Souter, Jas. S.	0	10	6
Staning, Walter	0	5	0
Stoakes, Benjamin M.	0	5	0
Walton, W. H.	0	5	0
Wilson, Mrs.	0	2	6
Hunstanton.			
Twiss, Wm.	0	10	6
Huntingdon.			
Baxter, Robert	0	10	6
Huntly (N.B.).			
Chalmers, G.	0	2	6
Hyères (France).			
Skinner, A. J. P.	0	5	0
Hyde.			
Oldfield, Henry	0	10	6
Hythe.			
Lemmon, R. A.	0	7	6
Idle (Yorks).			
Hopton, Edwin	0	5	0
Ilfracombe.			
Crang, Walter	0	10	6
Lacey, James	0	5	0
Ilkeston.			
Potts, R. S.	0	10	6
Ilkley.			
Worfolk, George William	0	5	0
Ilminster.			
Caliander, W. W.	0	2	6
Ingatestone.			
Stuart, Henry James	0	5	0
Invergordon.			
Sinclair, Robert	0	5	0
Inverness.			
Galloway and Son	0	10	6
MacRitchie, David	0	5	0
Ipswich.			
Anness, Samuel R.	0	10	6
Chapman and Pain	0	10	6
Clifton, E. S.	0	5	0
Cornell, William	1	1	0
Cossey, James D.	0	5	0
Eyre, Henry R.	0	5	0
Lyon, Robert	0	5	0
Matcham, Edward	0	5	0
Miller, T. T.	0	5	0
Pain, Arthur	0	5	0
Spurgeon, Fredk. J.	0	5	0
Younger, Robert E.	0	5	0
Irvine.			
Gillespie, James	0	7	6

Isleworth.	£	s.	d.
Reece, James	0	5	0
Jarrow-on-Tyne.			
Huckebridge, J. M., jun.	0	5	0
Jedburgh.			
Peters, J. F.	0	5	0
Jersey.			
Barker, John T.	0	10	0
Cole, George	0	10	6
Duprey, Jean A. B.	0	2	6
Ereaut, George	1	0	0
Ereaut, John, jun.	1	0	0
Millais, Mrs.	1	1	6
Miller, Henry	0	5	0
Kendal.			
Bateson, Thomas	1	1	0
Burton, Matthew	1	1	0
Hind, Thomas W. L.	1	1	0
Severs, Joseph	1	1	0
Kenilworth.			
Barton, Henry Emlyn	0	10	6
Keswick.			
Townley, Thomas	0	10	6
Kettering.			
Denston, John Thomas	0	10	6
Gray, William	0	5	0
Thursfield, John F.	0	5	0
Kidsgrove.			
Griffiths, Edwin H.	0	10	6
Kimberley (South Africa).			
Helmore, W. H.	0	5	0
Kilmarnock.			
Borland, John	1	1	0
Borland, John, jun.	0	10	6
King's Lynn.			
Atmore, George	0	5	0
Cocher, John A.	0	5	0
Wigg, William C.	0	10	0
Kingston-on-Thames.			
Bond, C. R.	0	10	6
Brewster, William	0	10	6
Higgs, Alfred	0	5	0
Walmsley, Samuel	0	5	0
Whaley, Edward	1	1	0
Kingstone.			
Ackrill, George	0	10	6
Kington.			
Venables, Samuel H.	0	5	0
Kirkcaldy.			
Kennedy, William	0	2	6
Storrar, David	1	11	6
Kirkham (Lancs).			
Ward, Henry S.	0	5	0
Kurrachee (India).			
Brown, Leonard H.	0	8	6
Lancaster.			
Arkle, William	0	5	0
Bagnall, W. H.	0	5	0
Holmes, Edward	0	5	0
Troughton, Henry	0	5	0
Vince, James	0	5	0
Landport.			
Alderslade, William	0	5	0
Hackman, Leonard L.	0	10	6
Perfect, George	0	5	0
Read, William	0	10	6
Langholm.			
Beattie, Thomas	0	5	0
Langport.			
Chant, Herbert A.	0	10	6
Largs (N.B.).			
Fraser, Alexander	0	5	0
Launceston.			
White, Thomas	0	10	6
Laxey.			
Whineray, Edward	0	2	6
Leamington.			
Barnitt, John	0	10	6
Barrett, Josephus T.	1	1	0
Bell, Robert	0	2	6
Bloomfield, E. J.	0	2	6
Chapman, W. H.	0	2	6
Clagur, F. Maltby	0	2	6
Clower, John	0	5	0
Davis, Benjamin	0	5	0
Davis, Henry	1	1	0
Lemmon, Eric	0	5	0
Marston, James	0	2	6
Matthews, H. J.	0	2	6
Morgan, J. C.	0	2	6
Newby, Charles A.	1	1	0
Pearson, W. J.	0	2	6
Pullin, William H.	0	10	6
Sansom, Henry	0	10	6
Skidmore, John	0	2	6
Smith, Samuel A.	1	1	0
Smith, Samuel H.	0	5	0
Spilsbury, James	0	5	0
Stanley, Herbert	0	10	6
Thornton, Edward	0	5	0
Leatherhead.			
Waugh, Mrs. Alexander	0	10	6
Lechlade.			
Ballard, Edwin	0	5	0
Ledbury.			
Freeman, Ernest	0	10	6
Leeds.			
Archer, Joseph S.	0	2	6
Bilbrough, Joseph B.	0	10	6
Bottomley, A. F.	0	5	0
Branson, F. W.	0	10	6
Cole, E. H.	0	5	0
Exley, George	0	5	0
Fawthorp, James	0	5	0
Ferguson, William K.	0	10	6
Goodall, Backhouse and Co.	2	2	0
Hardcastle, John	0	5	0
Harvey, Thomas	1	1	0
Hirst, Brooke and Hirst	2	2	0
Hirst, David	0	5	0
Holmes, Joseph	0	10	6
Iredale, Thomas	0	5	0
Jefferson, Peter	0	10	6
Morgan, Edward	0	5	0
Pierson, Clement	0	5	0
Reynolds, Richard	1	1	0
Smeeton, William	0	10	6
Staning, William	0	2	6
Taylor and Fletcher	1	1	0
Taylor, Samuel	1	1	0
Woolford, James	0	5	0
Leek.			
Blades, Josiah B.	0	2	6
Johnson, William	0	5	0
Leicester.			
Berridge, Alfred	0	5	0
Broof, R.	0	10	6
Burford, S. F.	0	5	0
Butler, E. H.	0	5	0
Butler, J. A.	0	5	0
Butler, T. E.	0	5	0
Cadoux, S. K.	0	2	6
Carr, William	0	10	0
Clark, E. A.	0	5	0
Clark, John W.	2	2	0
Clark, Walter B.	0	10	6
Cleaver, Samuel	0	5	0
Cooper, Henry	0	5	0
Cox, S. G.	0	10	0
Ellis, George	0	5	0
Esam, Richard	0	5	0
Gammidge, Samuel	0	5	0
Garrett, John	0	5	0
Harvey, William R.	0	10	6
Hodgson, C.	0	2	6
Lloyd, T. H.	1	1	0
Marston, S.	0	2	6
Pechey, Thomas P.	0	5	0
Pickering, Henry	0	5	0
Sharp, Edward K.	0	5	0
Wand, Stephen	1	1	0
West, J. L.	1	1	0
Wilby, Frederick W.	0	10	6
Woolley, G. J. B.	0	5	0
Leigh.			
Bennett, John W.	0	5	0
Leighton Buzzard.			
Herington, Joseph	1	1	0
Leith.	£	s.	d.
Alexander, W. G.	0	5	0
Black, George	0	5	0
Bowman, J.	0	10	
Dow, William	0	2	6
Duncan, Flockhart, Powell and Co.	0	10	6
Finlayson, Thomas	0	5	0
Gutherie, Andrew D.	0	2	6
Halley, William	0	5	0
Mair, Alexander	0	2	6
Smith, Wilson and Co.	0	10	6
Walker, Alexander	0	2	6
Lenton.			
Wilson, Thomas	0	5	0
Leominster.			
Davis, David F.	1	1	0
Leven.			
Gibson, Adam	0	10	6
Lewes.			
Briscoe, Charles	0	5	0
Head, John	0	10	6
Head, John T.	0	10	6
Martin, Thomas	0	10	6
Martin, W. T.	0	5	0
Leyland.			
Hackforth, Frederick	0	10	6
Lincoln.			
Battle, Son and Maltby	0	10	6
Tomlinson, Charles K.	1	1	0
Woodcock, Page D.	0	5	0
Liskeard.			
Young, Richard	0	5	0
Little Chishill,			
Jefferson, Thomas	0	10	6
Littlehampton.			
Smart, C. F.	1	0	0
Little Sutton.			
Sherlock, John	0	5	0
Litherland.			
Edwards, Richard	0	5	0
Liverpool.			
Abraham, Alfred Clay	1	1	0
Abraham, Thomas Fell	1	1	0
Adams, Thomas E.	0	10	6
Adams, T. E., jun.	0	5	0
Albright, Henry	0	5	0
Alexander, George	0	5	0
Alexander, John	0	10	6
Aris, G. H.	0	2	6
Ashbourne, C.	0	5	0
Ayrton and Saunders	0	10	6
Bache, William	0	2	6
Bathgate, William Lorimer	0	10	6
Baxter, William	0	10	6
Bell, W.	0	5	0
Bennett, W. R.	0	5	0
Billington, Frederic	0	5	0
Blabey, J. J.	1	0	0
Blackbourne, H. J.	0	5	0
Blake and Mackenzie	0	10	6
Blood, Charles	0	5	0
Blundell, John	0	10	0
Bond, Henry	0	2	6
Bowman, William	0	10	6
Bramwell, Rhodes	0	5	0
Brown, Joseph	0	2	6
Buck, Richard C.	0	5	0
Budden, Frederick	0	2	6
Budden, William	0	5	0
Caley, J. C.	0	10	6
Chemists' Association	2	2	0
Clark, F.	0	5	0
Clarke, R. T.	0	5	0
Clay, Dod and Case	1	1	0
Collins, E. de Tedney	0	5	0
Coupland, Henry	0	10	6
Crawley, B.	0	5	0
Dale, John	0	10	6
Day, J. R.	0	5	0
Dickins, B.	0	5	0
Drawbridge, Joseph G.	0	10	6
Drawbridge, T. F.	0	5	0
Drew, S.	0	5	0
Edisbury, John	0	10	6
Edisbury, Lawton	0	5	0
Edwards, E. W.	0	2	6
Ellams, George	0	10	6
Elliott, Robert John	0	10	0
Evans, Sons and Co.	5	5	6

Liverpool—continued.	£	s.	d.
Evans, William	0	5	0
Fergusson and Co.	1	1	0
Fergusson, Margaret	1	1	0
Field, C.	0	10	6
Fingland, James	0	10	0
Fleming, Mrs.	0	5	0
Flint, John	0	10	6
Furniss, Thomas	0	5	0
Gabites, W.	0	2	6
Girvan, John	0	5	0
Greenall, Alfred	1	1	0
Greenwood, Harriet E.	0	5	0
Hackett, Thomas	0	10	0
Hallawell, Joseph	1	1	0
Hall, Thomas	0	10	6
Hannaford, William	0	10	6
Harriman, E.	0	5	0
Harris, F. G.	0	10	6
Hay, Thomas	0	10	6
Herbert, John	0	2	6
Hocken, Joshna	0	10	6
Hodges, E. G.	0	5	0
Hughes, Michael	0	5	0
Hughes, Thomas I. J.	0	5	0
Hunt, Thomas	0	10	6
Jackson, F.	0	2	6
Jackson, H.	0	10	6
James, John	0	5	0
Jones, Frank	0	5	0
Jones. R. H.	0	5	0
Jones, William	0	5	0
Lee, Samuel	0	10	0
Lett, Arthur J.	0	5	0
Longrigg, W. S.	0	10	0
Machin, Frederick J.	0	10	6
McGuffie and Co.	1	1	0
Mackinlay, F. J.	1	1	0
Manduell, Thomas	0	2	6
Maries, D. R.	0	5	0
Maskery, Samuel	1	1	0
Merrett, R. H.	0	5	0
Midgley, John E.	0	2	6
Palmer, H. J.	0	5	0
Parkinson, Richard	0	10	6
Parry, William	0	5	0
Pearson, E. S.	0		6
Pheysey, Richard	0	10	6
Ratcliffe, George	0	5	0
Redford, A.	0	5	0
Richardson, Richard T.	0	10	6
Ridgway, T. E.	0	5	0
Rodgerson and Co.	0	2	6
Roe, R. P.	0	2	6
Salter, T.	0	10	6
Sawden, Alfred	1	1	0
Shaw, John	1	1	0
Shields, S.	0	2	6
Sleggs, G. R.	0	5	0
Smith, J. J.	0	5	0
Smith, R. G.	0	5	0
Smith, W. R.	0	5	0
Stavely, F.	0	5	0
Stott, Walter H.	0	5	0
Sumner, Robert, and Co.	1	1	0
Swain, William H.	0	2	6
Symes, Charles	3	3	0
Taylor and Co.	0	10	6
Taylor, Charles	0	10	0
Thomas, Robert	1	1	0
Thompson and Capper	1	1	0
Thompson and Co.	1	1	0
Thompson, John	0	5	0
Towler, G. B.	0	2	6
Troughton. Christopher	0	5	0
Warhurst, W. T.	1	1	0
Williams, John	0	5	0
Williams, R. P.	0	2	6
Williams, Thomas	0	3	6
Williams, William	0	5	0
Williams, William	0	2	6
Williams, William	0	2	6
Williams, William	0	5	0
Woodhead, H. C.	0	10	6
Wright, William	0	10	0
Wright, W. Owen	0	10	0
Wyatt, H.	0	5	0
Yeats, Thomas F.	0	5	0

Llandilo.

Williams, W. J.	0	2	6

Llandudno.

Penney, W. S.	0	10	6

Llanelly.

Evans, G.	0	10	6

Llanerchymedd.

Williams, Griffith	0	5	0

Llangollen.

Jones, Humphrey	0	5	0

Llanrwst.

Jones, Owen	0	2	6

Lockwood.

Lister, C. E.	0	5	0

Loddon.

Ellis, T. W.	0	10	6

London.

Alcock, Frank H.	0	2	6
Allan, James H.	1	1	0
Allden, John	0	10	6
Allen, Charles B.	1	1	0
Allgood, E. J.	0	5	0
Allwright, Isaac B.	0	10	6
Andrews, Frederick	0	10	6
Applegate, Edwin	0	10	6
Arkinstall, William	0	10	6
Atkinson, James	0	2	6
Atkinson, John G.	0	5	0
Attwood, Alfred	1	1	0
Attwood, Henry E.	1	1	0
Austin, Henry Felix	1	1	0
Babb, James	0	5	0
Baily, John	0	10	6
Baines, James C.	0	5	0
Baker, Alfred P.	0	10	6
Ball, The Chemists' (Committee of), per J. F. Savory.	31	10	0
Ball, The Junior Pharmacy, per W. H. Kerr	15	15	0
Barber, Joseph	0	10	6
Barnard, John	1	1	0
Barnes, James Benjamin	1	1	0
Barret, Edward Louis	1	1	0
Barritt, J.	0	2	6
Barron, Frederick	10	10	0
Bartlett, G. F. H.	0	5	0
Bartley, George A.	0	10	6
Barton, William H.	0	10	6
Bascombe, Frederick	0	5	0
Bate, Henry	0	10	6
Baxter, William	1	1	0
Beard, T. W.	0	10	6
Beasley, Frederick	0	5	0
Beddard, John	1	1	0
Bedford, C.	0	10	6
Beere, L. E.	0	5	0
Bell, Matthew W.	1	1	0
Bell, William H.	1	1	0
Bennett, George	0	5	0
Bennett, Thomas	0	5	0
Bently, William Jas.	0	10	6
Best, James	0	10	6
Bettinson, W. T.	0	5	0
Bigg, Thomas	1	1	0
Bilson, F. E.	0	5	0
Bindloss, G. F.	0	5	0
Bingley, Richard	0	10	6
Birch, Henry C.	1	1	0
Bird, Augustus	2	2	0
Bird and Storey	1	1	0
Bird, Robert	0	10	6
Bishop, Henry	0	2	6
Blain, A. Lucas	0	5	0
Blake, Charles A.	0	10	6
Bland, John	0	10	6
Blyth, Utton	0	5	0
Bond, Peter G.	0	5	0
Boothby, H. N.	0	5	0
Bourdas, Isaiah	1	1	0
Bowden, A.	1	1	0
Bowen, John W.	0	5	0
Bradshaw, C. H.	0	5	0
Brand and Co.	1	1	0
Bray, William	0	10	6
Bridges, C. W.	0	5	0
Bright, Frederick	0	5	0
Brisley, George	0	5	0
Brodribb, J. B.	0	10	0
Brookes, Samuel	0	10	6
Brooks, Charles	0	2	6
Brown, Alfred James	0	10	6
Brown, H. F.	0	10	6
Buckle, Christopher Francis	0	10	6
Bullen, George William	0	10	6
Bullock, J. Lloyd and Co.	2	2	0
Bunker, James	0	2	6
Burgess, Willows and Francis	1	1	0
Burgoyne, Burbidges, Cyriax and Farries	2	2	0
Burn, Henry	0	5	0
Burton, Joseph	0	2	6
Bush, Arthur	0	5	0
Butler, Charles	0	10	6
Butler, E. D. Barry	0	10	6
Butt, Edward Northway	3	3	0
Butterworth, John	0	5	0
Cadman, Daniel	1	1	0
Callaway, Lemuel	0	10	6
Campbell, E. K.	0	2	6
Cannon, Charles	1	1	0
Carteighe, Michael	1	1	0
Cartwright, William B.	0	10	6
Caseley, Thomas	0	5	0
Catterns, Heneage P.	0	10	6
Cawdell, George	0	10	6
Chapman, Joseph J.	0	5	0
Chapman, Walter	0	5	0
Charity, William	0	10	6
Cheetham, W. H.	0	10	6
Churchill, J. and A.	1	1	0
Clapp, Edward F.	0	10	6
Clark, John A.	0	10	6
Clarke, Isabella Skinner	0	10	6
Clayton, Thomas	0	5	0
Cleaver, E. L.	0	10	6
Clift and Crow	1	1	0
Cocker and Son	0	10	6
Colchester, William M.	0	5	0
Colchester, William M., jun.	0	5	0
Coldwell, David B.	0	10	6
Cole, A. C.	1	1	0
Coleman, John	0	5	0
Coles, Ferdinand	0	10	6
Coles, J. W.	0	10	6
Collett, Charles B.	0	5	0
Collier, Henry	0	5	0
Constance, Edward	0	10	6
Constance, Herbert E.	0	10	6
Constance, Sidney W.	0	10	6
Cooper, Henry	0	10	6
Cooper, Wm. Henry	0	10	6
Cooper, William Temple	0	10	6
Corbyn, Stacey and Co.	1	1	0
Cornelius, James	0	10	6
Cory, J. T. H.	0	10	6
Cosway, Edwin C.	0	10	6
Cottrill, John W.	0	10	6
Couper, F.	0	10	6
Coverley, Edwd. C.	0	5	0
Cracknell, Herbert	0	5	0
Cranwell, W. B.	2	2	0
Crosby, James	0	10	6
Cross, Henry	0	2	6
Croyden, Charles	0	10	6
Cull, Joseph	0	10	6
Curtis, Fred. G.	0	5	0
Dampney, Richard S.	0	10	6
Darby and Gosden	2	2	0
Darnill, Charles	0	5	0
Davenport, Horace	1	1	0
Davenport, J. T.	2	2	0
Davies, Charles	1	1	0
Davies, John	0	5	0
Davies, Robert H.	1	1	0
Davis, H. S. E.	0	10	6
Davy, Yates and Routledge	2	2	0
Day, Thomas Sweeting	0	10	6
Dean, S.	0	5	0
Deane (Henry) and Co.	1	1	0
De Peare, John Thomas	0	5	0
Dewar, Mary Ann	0	10	6
Dinneford and Co.	2	2	0
Dobell, Dr. Horace	1	1	0
Dodman, Robert	0	2	6
Dodridge, Thos.	0	2	6
Doulton and Co.	1	1	0
Drane, William	0	10	6
Drew, Henry Wm.	0	5	0
Drury, Sydney	0	5	0
Duckett. F. W.	0	10	6
Dymott, Frank	0	5	0
Dyson, William B.	1	11	6
Eade, George	1	1	0
Eade, James	1	1	0
Eastman, J. E.	0	10	6
Edwards, Charles	0	10	6
Edwards, William Staples	0	5	0
Elliott, J. D.	0	5	0
Elvey, Thomas	1	1	0
Emslie, Joseph	0	5	0
Epps, James	1	1	0
Evans, Lescher and Webb	1	1	0
Eve, Charles	1	1	0
Evershed, G. S.	0	5	0
Eyre, Jonathan S.	0	10	6
Fallowfield, Jonathan	1	1	0
Farmer, John	0	5	0

London—continued.	£	s.	d.
Ferguson, W. H.	1	1	0
Field, William	1	1	0
Fitch, Robert Owen	0	10	6
Fitt, Francis E.	0	10	6
Forrest, Richard	1	1	0
Fowler, William	0	2	6
Fox, William	1	1	0
France, J. M.	0	5	0
Francis, George Baggett	1	1	0
Francis, Matthew R.	0	10	6
Francis, W. H.	0	10	6
Froom, William Henry	1	1	0
Frost, John H.	0	2	6
Frost, W. T.	0	10	6
Fryer, Arthur	0	5	0
Furze, Mrs. H.	0	10	6
Gadd, Charles	0	10	6
Gadd, Robert	0	10	6
Gale, Henry	0	10	6
Gale, Samuel	1	1	0
Garner, James	0	10	6
Garner, Thomas	0	5	0
Garnham, A. W.	0	5	0
Garrett, John H.	0	5	0
Gaunt, Rann Dolphin H.	1	1	0
Gedge, William S.	0	10	6
Gerrard, A. W.	0	10	6
Glasspoole, H. G.	0	10	6
Godfrey, H. E.	0	5	0
Goff, Richard	0	5	0
Golding, John F.	1	1	0
Goodall, William A.	0	5	0
Goodchild, Alfred C.	0	5	0
Goodger, David	0	10	6
Goodwin, John	1	1	0
Gorton and Sons	0	10	6
Gossling, William R.	0	5	0
Gostling, W. A.	0	10	6
Gower, A. J.	0	5	0
Graham, Henry	0	5	0
Granger, Edwin John	1	1	0
Green, Samuel	0	5	0
Greenish, T. Edward	0	10	6
Greenish, Thomas	1	1	0
Griffiths, Alfred William	0	10	6
Grimwood, William	0	10	6
Gristock, Thomas	1	1	0
Groves, H. F.	2	2	0
Gudgeon, Frederick G.	0	2	6
Gulliver, William	0	10	6
Gulliver, Wm. Inchle	0	5	0
Hairsine, H. S.	1	1	0
Hall, Ralph	0	10	6
Hampson, Robert	1	1	0
Hanbury, Cornelius	1	1	0
Hardy, Samuel C.	1	1	0
Harris, Daniel R.	0	10	6
Hart, Thomas	0	2	6
Harvey, Edward	1	1	0
Harvey, John William	0	2	6
Harwood, Charles	0	10	6
Hatfield, George B.	0	10	6
Hawkins, Thomas	1	1	0
Hayward, Charles	0	10	6
Hearn, John	0	5	0
Heath, Frederick D.	0	5	0
Heathcoat, Thomas	0	10	6
Henty, Henry Martin	0	5	0
Herbert, William	0	5	0
Hick, John	0	5	0
Hickey, Evan Lewis	0	10	6
Hickman, William	0	10	6
Higgins, James	0	10	6
Hill, Arthur B.	1	1	0
Hill, Arthur S.	2	2	0
Hill, William	0	5	0
Hillgenberg, Louisa	1	1	0
Hills, Henry William	0	10	0
Hills, Thomas Hyde	10	10	0
Hills, Walter	1	1	0
Hodgkinson, George A.	0	10	6
Hodgkinson, Stead and Treacher	2	2	0
Hodgkinson (Thomas), Prestons and King	2	2	0
Hodgkinson, William	1	1	0
Hodsoll, Thomas W. H.	1	1	0
Hogg, E. G.	0	10	6
Hogg, Robert	0	10	6
Holford, T. Constantine	0	10	0
Holl, Edmund	0	5	0
Holmes, C. J.	1	1	0
Holmes, Walter M.	0	10	6
Hooper, Leonard	1	1	0
Hopkin, William King	2	2	0
Hora, Henry Whinfield	1	1	0
Horncastle, John	1	1	0
Horne, John	0	5	0
Horsley, T. W.	0	10	6
Howard, George	1	1	0
Howard, J. H. H.	1	1	0
Howell, Maurice	0	10	6
Howlett, Samuel	1	1	0
Hucklebridge, J. M.	1	1	0
Hudson, T. F.	0	5	0
Huggins, Richard	0	10	6
Hughes, Evan	0	7	6
Hugill, John	1	1	0
Hugill, John H.	1	1	0
Humpage, Benjamin	0	10	6
Hunt, Charles	1	1	0
Huskisson, Henry Owen	1	1	0
Hussey, Robert	0	5	0
Hutton, Harry	0	2	6
Hyslop, John Cahill	0	10	6
Icke, Henry S.	0	10	6
Idris and Co.	2	2	0
Ingham, John	0	5	0
Ingram and Royle	1	1	0
Ive, William	1	1	0
Izod and Son	1	1	0
Jacka, Vivian T.	0	10	6
Jacks, D. R.	0	5	0
Jackson, C.	0	10	6
Jackson, Charles	0	10	6
Jackson, William F.	0	10	6
Jackson, William H.	0	5	0
Jagg, J. Henry	0	10	6
Jameson, W. G., junr.	1	1	0
Jarvis, John S.	0	10	6
Jeffcoat, Joseph	1	1	0
Jenkins, Henry	1	1	0
Johnson, Joseph	0	10	6
Johnson and Sons	1	1	0
Jones, Edwin	0	5	0
Jones, Henry Stevens	0	5	0
Jones, John H.	0	10	6
Jones, Thomas	0	5	0
Jones, W. Cadwaladr	0	10	6
Jones, William	0	10	6
Jones, William	0	5	0
Jones, William E.	0	2	6
Jones, William John	0	10	6
Jones, William N.	0	2	6
Jones, William O.	0	10	0
Jozeau, G.	1	1	0
Keer, Thomas H.	0	10	6
Kemp, Robert	0	10	6
Kendall, Charles F.	0	10	6
Kent, James S.	0	10	6
Kent, Thomas	0	10	6
Kent, Thomas Ramsey	0	10	6
Kinch, Edward	0	10	6
King, Henry	0	10	0
King, William	0	5	0
Kingsford, Frederick	1	1	0
Kirk, Snowden	0	10	6
Kitson, Samuel	0	2	6
Laing, John S.	0	5	0
Lance, W. N. G.	0	10	6
Lang, Alfred	0	5	0
Large, John H.	0	10	6
Lavers and Son	1	1	0
Lawrence, Frederick	0	10	6
Laws, John	0	10	6
Leath and Ross	2	2	0
Leech, Elizabeth	0	10	6
Legg, H. A.	0	10	6
Lescher, Joseph S.	1	1	0
Lewinton, Alexander B.	1	1	0
Lewis, Thomas	0	2	6
Leyland, Thomas W.	0	2	6
Little, John A.	0	5	0
Lloyd, Thomas	0	10	6
Long, Henry	1	1	0
Longley, Charles	0	5	0
Lovegrove, G. E.	0	5	0
Lowe, William E.	2	2	0
Lowther, M. K.	0	5	0
Luff, Richard	0	10	6
McDougall, James	0	2	6
MacGeorge, William	0	10	6
Maitland, John	1	1	0
Maizey, E.	0	10	6
Manley, W. F.	0	10	6
Marks (Henry) and Sons	1	1	0
Marsh, E. R.	0	10	6
Marston, John Thomas	0	10	6
Marten, Frederic	0	5	0
Martindale, William	1	1	0
Mason, H. C.	1	1	0
Mathews, Henry	0	10	6
Matthews, E. S.	0	5	0
Matthews, J. H.	0	5	0
Matthews, Thomas	0		0
Maw, Charles	1	1	0
Maw, Son and Thompson	2	2	0
Mead, Charles J.	1	1	0
Meggeson and Co.	1	1	0
Melhado, Howard E.	0	2	6
Mellin, Charles J.	0	5	0
Merrell, James	1	1	0
Middleton, Francis	1	1	0
Miller, Cecil B.	0	5	0
Miller, Charles Bayfield	0	10	6
Miller, W. E.	0	5	0
Mills, W. D.	0	2	6
Milward, S.	0	10	6
Minshull, Flora	0	5	0
Minshull, Rose C.	1	1	0
Moore, John	0	5	0
Morrell, Thomas	0	5	0
Morris, Thomas	1	1	0
Mortiboy, John	1	1	0
Mould, Samuel	0	10	6
Muskett, Albert C.	0	10	6
Mutch, John Pratt	0	5	0
Muter, Dr. John	3	3	0
Naylor, W. A. H.	0	5	0
New, Walter W.	0	10	6
Newey, J. T.	0	10	6
Newton, T. A. C.	0	5	0
Newzam, Henry Samuel	0	10	6
Nicholls, Joseph C.	0	5	0
Nicholson, Frederick	1	1	0
Nicholson, Thomas T.	0	5	0
Nind, George	0	10	6
Nobbs, W. N.	0	10	6
Norburn, A. H.	0	10	6
Norfolk, J. W.	0	5	0
North, George T.	0	10	6
Nosworthy, Robert	0	10	6
Odell, George W.	0	5	0
Oldfield, Henry	0	10	6
Orpe, Thomas M.	0	10	6
Owen, John	1	1	0
Palmer, Francis	0	10	6
Palmer, Robert	1	1	0
Paramore, Dr. R.	0	5	0
Parker, J. W.	0	5	0
Parker, Robert Henry	0	10	6
Parkes, J. C.	0	10	6
Parkes, J. P.	1	1	0
Parkinson, Charles	0	10	6
Parkinson and Son	1	1	0
Parrott, Joseph	0	10	6
Parry, C. D.	0	5	0
Parsons, G. H.	2	2	0
Pasmore, F. R.	0	10	6
Pass, Horatio	0	10	6
Passingham, G. W.	0	5	0
Pattison, George	1	1	0
Peacock, George	0	5	0
Peck, Edward	0	5	0
Peel, Alfred	0	10	6
Penrose and Son	1	1	0
Pepper, John	0	10	6
Pharmacy Club (per Richard Bremridge, Hon. Sec.)	10	10	0
Pickard, William	2	2	0
Pidduck, J. W.	0	10	6
Pike, William	0	10	6
Pinyon, William	0	5	0
Pipe, Walter	0	10	6
Place, John N.	0	10	6
Plaister and Hillen	1	1	0
Plowman, Sidney	1	1	0
Poingdestre, C. R.	0	10	6
Pond, B. C.	0	5	0
Pond, George P.	1	1	0
Potts, Robert A.	1	1	0
Pound, Matthew	1	1	0
Powell and Sons	1	1	0
Powell, T. H.	1	1	0
Prebble, John G.	0	5	0
Preston, Richard	0	10	6
Pretty, Charles	0	5	0
Price, Robert John	0	2	6
Price and Wardle	0	10	6
Prichard, Edward	1	1	0
Prime, Thomas R.	0	10	6
Radermacher, C. J.	0	10	6
Rawlinson, Ralph	1	1	0
Read, John Henry	0	5	0
Reece, Thomas	0	5	0
Rees, Harding	0	10	6
Richardson, George	0	10	6
Richardson, James	0	5	0
Richardson, John	0	5	0
Ridding, William	0	10	6
Rigg, G. F.	0	5	0
Roach, H. W.	1	1	0

London—continued.	£	s.	d.
Roach, Pope	1	1	0
Roberts, Peter	1	1	0
Robinson, Charles J.	0	10	6
Robinson, H. S.	0	5	0
Robinson, R. A.	0	10	6
Robinson, William P.	0	10	6
Rogers, James	0	10	6
Rogers, Oliver	0	5	0
Rose, Alfred	1	1	0
Roper, R. F.	0	5	0
Rowden, Lewis	0	5	0
Rowe, Robert	1	1	0
Rowntree, Thomas	0	10	6
Rowson, Henry	1	1	0
Rutter, Edmund Yates	1	1	0
Rutter, John	0	5	0
Sadler, William	0	10	6
Sadler, William, jun.	0	5	0
Sainsbury, Samuel	1	1	0
Sandford, Geo. W.	2	2	0
Sandy, Frederick William	0	10	6
Sangster, Arther	1	1	0
Saunders, C.	0	10	6
Schacht, William	0	10	6
Schweitzer, Julius	2	2	0
Scoley, Thomas E.	0	5	0
Scrase, Richard	0	5	0
Sell, W. H.	0	10	6
Selleck, Edward	0	10	6
Severs, Samuel Thomas	1	1	0
Shapcott, W. H. P.	0	2	6
Sheffield, Arthur J.	0	5	0
Shephard. Thomas F.	0	10	6
Shepley, Frederick Thos.	0	5	0
Sherwood, N.	0	5	0
Shields, R. H.	0	5	0
Shirley, J. G.	2	2	0
Shirley, S. S.	0	10	6
Silverlock, Henry	5	5	0
Silvers, Francis T.	0	10	6
Simpson, Henry	0	10	6
Simpson, John	0	5	0
Simpson, Thos.	0	5	0
Sims, C. R. H.	0	10	6
Slipper, James	0	10	6
Smart, John	0	10	6
Smart, W.	0	10	6
Smith, C. B.	0	5	0
Smith, James W.	0	5	0
Smith, John Ord	0	10	6
Smith, Percy John	1	1	0
Smith, William	0	10	6
Smith, William	0	2	6
Smith, William Frederick	1	1	0
Smith, William L.	0	10	6
Spurling, W. E.	0	5	0
Spyer, Newton	0	10	6
Squire, P. and P. W.	5	5	0
Stableforth, J. W.	0	5	0
Stacey. Samuel Lloyd	1	1	0
Stammwitz, Louisa	1	1	0
Stamp, Edward B.	0	10	6
Stansfield, Richard	0	5	0
Starkie, Richard S.	1	1	0
Starkey, E. B.	0	2	6
Steer, Philip R.	0	10	6
Stenson, Joseph	0	5	0
Stevens, Felix	0	5	0
Stevens, Peter Augustus	0	10	6
Stickland, W. H.	1	1	0
Stiling, John E.	0	5	0
Stoneham, Philip	0	10	6
Strickett, John	0	10	6
Strongitharm, W. G.	0	5	0
Summers, James R.	0	10	6
Swan, M. E.	0	5	0
Swift, Francis	0	10	0
Symons, William H.	1	1	0
Taplin, William Gilbert	1	1	0
Taubman, Robert	0	10	6
Taylor, George S.	1	1	0
Taylor, Horatio	0	10	6
Taylor, John	0	10	6
Taylor, Peter	0	5	0
Tebbutt, Edwin	0	5	0
Thompson, C.	0	5	0
Thompson, Henry	0	10	6
Thompson, Henry Ayscough	1	1	0
Thompson, John	1	1	0
Thorn, John James	1	1	0
Thornley, F.	0	2	6
Tijou, Tom	0	5	0
Tingle, Thomas	1	1	0
Tippett, Benjamin M.	0	10	6
Tomlinson, Thomas	1	1	0
Trask, Thomas	1	1	0
Tregear, A. F.	0	5	0
Trick, William B.	0	5	0
Troke, Charles	0	10	6
Tugwell, William H.	0	10	6
Turner, Charles E.	0	10	6
Turner, Edward A.	1	1	0
Tyrer, Peter	0	10	6
Van, Frederiek W. S.	0	5	0
Vaughan, John	0	5	0
Vialls, J. B.	1	1	0
Vincent and Son	1	1	0
Voelcker, Augustus	1	1	0
Wakefield, Henry	2	0	0
Walker, Byatt A.	0	5	0
Walker, Charles	0	5	0
Wallis, George	0	5	0
Wallis, John T. W.	0	10	6
Wallis, Owen	0	10	6
Waring, A. W.	0	5	0
Warren, William	0	10	6
Wastie, Francis	0	2	6
Watson, William	0	10	6
Watts, Alfred	0	5	0
Way, J. F.	0	5	0
Weatherley, Richard J.	0	5	0
Webb, E. A.	1	1	0
Wells, Thomas	0	5	0
Weston, Samuel John	1	1	0
Westrup, Joseph B.	0	10	6
Whiffen, Thomas	3	3	0
Whigham, Robert L.	0	5	0
White, Charles	0	5	0
White, Charles E.	0	5	0
White, W. T.	1	1	0
Whittle, Elias C. C	0	5	0
Wickham, W.	0	10	6
Wigg, Henry J.	1	1	0
Wiggins, Henry	0	10	6
Wilkes, Henry	0	5	0
Wilkinson, Benjamin John	0	10	6
Wilkinson, Thomas	1	1	0
Will, William W.	0	5	0
Willats, Richard	0	5	0
Williams, Hugh	0	5	0
Williams, James	0	10	6
Williams, John	2	2	0
Williams, Joseph J.	0	5	0
Williams, J. W.	1	1	0
Williams, Thomas H.	0	5	0
Williams, William	0	5	0
Wills and Wootton	1	11	6
Winpenny, F. W.	0	10	6
Winter, William	1	1	0
Wise, Walter	0	10	6
Wisken, Robert	0	2	6
Wodderspoon and Co.	1	1	0
Wood, Edward	0	10	6
Woodland, John	0	10	6
Woolldridge, John	0	10	6
Woollings, Frank	0	2	6
Wooster, J. R.	2	2	0
Wootton, Alfred C.	2	2	0
Wright, Layman and Umney	2	2	0
Wyatt, Francis J.	0	10	6
Wylde, George	0	10	6
Yates, Samuel P.	0	5	0
Young George	0	5	0

Long Bennington.

Bemrose, John	0	10	6

Longton.

Barlow, F.	0	2	6
Hemming, George	0	2	6
Hulme, George	0	2	6
Litchfield, John	0	10	6
Prince, Arthur G.	0	10	0
Sibary, George	0	10	6
Turner, Thomas	0	5	0

Looe.

Poad, John	0	5	0

Loughborough.

Handley, Thomas	0	10	0

Louth.

Dennis, J. W.	0	5	0
Hurst, John	0	5	0
Hurst, John B.	0	5	0

Lowestoft.

Chaston, Anna Maria	0	10	6
Good, Thomas	0	10	6
Moverley, Robert	0	10	6
Sale, Thomas John	0	5	0
Wright, Arthur	0	5	0

Ludlow.

Bessell, J. W.	0	5	0
Cocking, George	0	5	0
Marston, Alfred	0	5	0
Nickson, James	0	5	0
Smith. F. W.	0	2	6
Woodhouse, George	0	5	0

Luton.

Hall, Ephraim	0		

Lutterworth.

Brown, Thomas	0	10	6

Lyme Regis.

Henley, George	0	5	0

Lymington.

Allen, Adam U.	0	5	0
Badcock, Henry	0	10	6
Madge, James C.	0	10	6

Lymm.

Evans, Isaac H.	0	5	0
Henshall, James	0	5	0

Lytham.

Hartley. John	0	5	0
March, Richard	0	5	0

Macclesfield.

Bates, William I.	0	10	6
Bower, John	0	5	0
Cooper, Thomas	0	5	0
Duncalf, Thomas H.	0	10	6
Lawrence, George P.	0	5	0
Thomas, Richard	0	10	6
Wood, Richard	0	10	6

Macduff.

Henry, J. Hay	0	5	0

Machynlleth.

Rees, Edward	0	5	0

Maidenhead.

Walton, Ralph	0	10	6

Maidstone.

Corfe, Alfred F.	0	5	0
Evans, D. C.	0	2	6
Ridley, Charles H.	0	5	0
Rowcroft, Albert E.	0	5	0
Stonham, Thos. G.	0	10	6

Malden, New.

Stone, Thomas William	0	5	0

Maldon (Essex).

Crick, George E.	0	10	6
Wallworth, David	0	10	6

Malmesbury.

Brown and Ratcliffe	1	1	0

Malta.

Woolldridge, G.	0	10	6

Malton (Yorks).

Buckle, James	0	5	0
Hardy, George	0	5	0
Laverack, W. H.	0	5	0
Longbotham, Mrs. M.	0	5	0

Malvern Wells.

Clark, Edward J.	0	5	0
Wakefield, Cecil H.	1	1	0

Manchester.

Balmforth, A.	1	1	0
Bates, Frederic W.	0	5	0
Benger, F. Baden	0	10	6
Bew, John	1	1	0
Blyton, John	0	10	6
Boor, Frederick	0	10	6
Booth, William G.	0	10	6
Brown, William Scott	1	1	0
Carter, William	0	10	0
Casey, Edward	0	2	6
Darling, William	1	1	0
Drinkwater, P. B.	0	5	0
Gibbons, Thomas G.	1	1	0
Gibson, Robert	1	1	0
Glanville, Robert	0	5	0
Hart, James	1	1	0
Jackson, George	0	10	6
Jackson, Thomas	0	10	6
Lane, William	0	2	6
Lowe, Walter	0	10	6
Marsden, Thos. B.	0	5	0
Maunder, Robert	0	10	6

Manchester—continued.	£	s.	d.
Mitchell, John	0	5	0
Mumbray, H. G.	0	10	6
Nuttall, R. H.	0	10	6
Oldfield, Pattinson and Co.	1	1	0
Paine, Standen	0	10	6
Pickup, Robert L.	0	10	6
Pidd, Arthur J.	0	10	6
Royle, John	0	5	0
Scaife, Samuel	0	5	0
Schofield, George T.	0	5	0
Stones, William	1	1	0
Stretch, J. H.	0	5	0
Swinn, Charles	0	10	6
Sylvester, Paul	0	5	0
Terry, Thomas	0	5	0
Thornley, C.	0	10	6
Tomkins, Dr. Henry	0	5	0
Tompsett, Leighton S.	0	5	0
Walsh, Edward	0	10	6
Wealthall, Alfred	0	10	6
West, Thomas	0	5	0
Whittaker, Ellis	0	10	6
Wilkinson, George	0	5	0
Wilkinson, William	1	1	0
Woolley, Sons and Co.	2	2	0
Wright and Barnaby	1	1	0
Yates, Ebenezer	0	5	0
Manningham.			
Pullan, Thomas	0	10	0
Mansfield.			
Adams, Benjamin	1	1	0
Oldham, John	0	10	6
Patterson, Douglas J.	0	5	0
March.			
Davies, P. H.	0	5	0
Vawser, Jesse	0	5	0
Margate.			
Cadby, Saml. K.	0	5	0
Candler, Joseph T.	0	10	6
Harvey, William S.	0	10	6
Wootton, Edward S.	0	10	6
Market Drayton.			
Cooke, William H.	0	2	6
King, William George	0	10	6
Market Harborough.			
Bragg, William B.	1	1	0
Markinch.			
Robertson, Andrew	0	2	6
Maryport.			
Cockton, John	0	5	0
Masham (Yorks).			
Barker, Mathew M.	1	1	0
Kendall, George	0	5	0
Matlock Bath.			
Platt, William	0	2	6
Melbourne (Australia).			
Stewart, W.	0	2	6
Mere (Wilts).			
Bracher, Edwin	0	5	0
Merthyr.			
Thomas, J. E.	0	2	6
Mevagissey.			
Kemble, James	0	2	6
Mexborough, New.			
Greaves, Eccles	0	2	6
Greaves, George S.	0	2	6
Shields, Robert J.	0	10	6
Micheldean.			
James, Henry	0	5	0
Middlesborough.			
Buck, Thomas	0	5	0
Charles, W. F.	0	5	0
Hall, R.	0	5	0
Harrington, P. J.	0	5	0
Hume, William A.	0	5	0
Middleton, Joseph	0	5	0
Sowerby, Richard	0	5	0
Taylor, H. H.	0	5	0
Taylor, William R.	0	5	0
Turner, Thos. E.	0	5	0
Midhurst.			
Cowap, Samuel E.	0	5	0
Millom.			
Richardson, Thomas	0	10	6
Minchinhampton.			
Simpkins, John	0	10	6
Mintlaw, (N.B.).			
Hardie, Alexander	0	5	0
Mirfield (Yorks).			
Crook, Charles	0	5	0
Monkwearmouth.			
Sayer and Gilbert	0	5	0
Monmouth.			
Key, Hobson	0	10	6
Montrose.			
Burrell, George	0	5	0
Davidson, A.	0	5	0
Morecambe.			
Birkett, John	0	5	0
Morpeth.			
Marshall, G. T.	0	5	0
Mussoorie (India).			
Samuel, James B. and Edward	1	1	0
Nailsworth.			
Mason, William W.	0	2	6
Nantwich.			
Manley, Henry	0	2	6
Naples.			
Bateman, J. M.	1	7	8
Natal.			
Taylor, Edward	0	7	10
Neath.			
Hayman, Alfred	0	10	6
Hutchins, Charles	0	2	6
Needham Market.			
Harrington, Allen	0	10	6
Nether Stowey.			
Ham, John	1	1	0
Newark.			
Bennett, William	0	5	0
Cooling, W. J.	0	5	0
New Barnet.			
Young, Robert Fisher	0	10	6
Newbottle.			
Hunter, Frederick W.	0	5	0
New Brighton.			
Rose, Charles	0	5	0
New Brompton (Kent).			
March, William	0	5	0
Willis, Henry J.	0	5	0
Newbury.			
Davis, Henry J.	0	5	0
Fielder, T. W.	0	5	0
Pratt, Thomas H.	0	5	0
Strawson, G. F.	0	10	6
Taylor, R. A.	0	2	6
Newcastle-on-Tyne.			
Bascombe, William	0	5	0
Bolan, John	0	10	6
Coates, John M.	0	10	6
Frater, G.	0	5	0
Gatward, Oswald	0	5	0
Ismay and Sons	0	10	6
Johstone, W. B.	0	5	0
Mann, Robert	0	10	6
Marley, William	0	10	6
Martin, N. H.	1	1	0
Mawson, R. O.	0	5	0
Owen, William	0	10	6
Payne, J. B.	0	5	0
Pike, John	0	2	6
Proctor, Barnard S.	1	1	0
Roberts, J.	0	10	6
Smith, G. F.	0	10	6
Stuart, Charles E.	0	10	6
Swan, Joseph W.	1	1	0
Watson, Mason	0	10	6
Weddell, George	0	5	0
Whitehead, G.	0	5	0
Wray, E.	0	2	6
Wright, Alfred	0	10	6
Newcastle-under-Lyne.			
Cartwright, William	0	10	6
Heathcote, Thomas S.	0	10	6
Newmarket.			
Barrow, Frank A.	1	1	0
Newport (I. W.).			
Millidge, Alfred	0	5	0
Shepperd, William J.	0	2	6
Newport (Mon.).			
Faulkner, H.	0	5	0
Garrett, James	0	5	0
Garrett, J. O,	0	5	0
Gratte, Henry J.	0	5	0
Morgan, Mrs.	0	2	6
Paine, Charles	0	10	6
Phillips, John	0	10	6
Price, George	0	5	0
Seys, James A.	0	5	0
Young, John	0	10	6
Newport (Salop).			
Picken, Thomas William	0	10	6
New Radford.			
Jenkins, John Thomas	0	5	0
Newthorpe.			
Robinson, Whiteley	0	5	0
Newton Abbot.			
Poulton, John	0	5	0
Wright, W.	0	5	0
Newtown (Mont.).			
Morgan, Richard	0	10	6
New Whittington.			
Slater, Arthur	0	5	0
Nice (France).			
Jobson, Thomas	0	5	0
Watson, James	1	0	0
Norbiton.			
Greenwood, J.	0	10	0
North Kelsey.			
Dixon, James	0	3	0
North Newbald.			
Everatt, Robert	0	2	6
Northallerton.			
Fairburn, Joseph	0	10	0
Squince, John A.	0	5	0
Warrior, Henry	0	5	0
Warrior, William	0	10	6
Northampton.			
Armitt, A.	0	5	0
Ashford, Evan Charles	0	5	0
Barry, James	1	1	0
Berry, J. P.	0	5	0
Bingley, John	0	10	6
Clarke, W. R.	0	5	0
Gulliver, George E.	0	5	0
Kirby, Frederick	0	5	0
Mayger, William D.	1	11	6
Negus, Samuel	0	15	0
Osborne, George C.	0	5	0
Saul, W. B.	0	5	0
Sindall, J. W. (Executors of)	0	5	0
North Walsham.			
Bailey, George Wm.	0	5	0
Northwich.			
Lee, William	0	5	0
Ramsey, Joseph	0	5	0
Norwich.			
Baker, Parsons C.	0	10	6
Caley, Albert J.	0	10	6
Cooke, William	0	5	0
Corder, Octavius	1	1	0
Cossey, John	0	5	0
Cripps, Johnson	0	5	0
Cubitt, Charles	0	5	0
English, Joseph	0	5	0
Gardiner, W. J.	0	5	0
King, H. A.	0	5	0
Nicholson, D. G.	0	5	0
Pentney, James C.	0	2	6
Roberts, R.	1	1	0
Robinson, James	0	5	0

Norwich—continued.	£	s.	d.
Stebbing, W.	0	2	6
Sutton, Francis	0	10	6
Taylor, H. E.	0	5	0
Thompson, H.	0	2	6
Watson, J. E. H.	0	10	0
Wilson, O. B.	0	5	0
Nottingham.			
Beardsley, J.	0	5	0
Beverley, R. H.	0	5	0
Bolton, Charles Alfred	0	10	6
Chemists' Association	6	6	0
Dadley, Elijah	0	10	6
Dennis and Roberts	0	5	0
Dennis, John L.	0	10	6
Edgson, Hugh	0	10	6
Fitzhugh, Richard	1	1	0
Fletcher, Thomas	0	5	0
Flowerdew, W. C.	0	2	6
Holgate, S. V.	1	1	0
Hopkins, J. H.	0	2	6
Jackson, Roberts	0	10	6
Lomas, Joseph	0	5	0
Manfull, H. J.	0	5	0
Mason, Thomas	0	10	6
Parker, W. H.	0	5	0
Patchitt, Edwin C.	1	1	0
Pearson, Edward	1	1	0
Potts, Charles	0	10	6
Rayson, J. T.	0	5	0
Smithurst, John	0	10	0
Taylor, Thomas C.	0	10	6
Warriner, C. W.	0	5	0
White, Frank	0	10	6
Whitworth, John	0	10	6
Wilford, J.	0	10	0
Nuneaton.			
Iliffe, George	0	5	0
Lester, Henry	0	5	0
Oakham.			
Wellington, James	0	10	6
Oldbury.			
Briggs, George	0	10	6
Oldham.			
Potts, Walter	0	5	0
Old Swindon.			
Smith, William John	0	5	0
Olney (Bucks).			
Wright, Ann	0	5	0
Oswaldtwistle.			
Haworth, William	0	10	0
Oswestry.			
Evans, John	0	10	6
Jones, Thomas	0	10	0
Roberts, William Carey	0	2	6
Smale, Mary E.	0	5	0
Smale, Richard B.	0	5	0
Vaughan, David	0	10	6
Otley (Yorks).			
Blade, E.	0	5	0
Pratt, Richard M.	0	10	6
Oundle.			
Turner, Robert	0	10	6
Over Darwen.			
Shorrock, R.	0	5	0
Oxford.			
Bessant, Frederick Railton	0	10	6
Bloxham, W. E.	0	5	0
Clayton, C.	0	2	6
Cousins, Thomas G.	0	10	6
Druce, George C.	0	5	0
Hill, James H.	0	5	0
Hitchcock and Son	1	1	0
Houghton and Sons	0	10	6
Jenkins, Alexander	0	5	0
Luff, William	0	5	0
Modlen, Robert	0	2	6
Prior, George T.	0	10	6
Squire, James	0	5	0
Thurland, Henry	0	10	6
Turpin, A. B.	0	5	0
Varney, Henry G.	0	2	6
Walsh, Edward	0	10	6

Paignton.	£	s.	d.
Sherriff, George	0	5	0
Paisley.			
Cullen, Thomas	0	5	0
Partick (N.B.).			
Rait, Robert C.	0	10	6
Pau (France).			
Jarvis, John	1	1	0
Smith, Charles C.	0	5	0
Paulton (Somerset).			
Bush, Thomas	0	5	0
Pembroke Dock.			
Bowling, John H.	0	2	6
Laen, William	0	5	0
Pendleton.			
Hume, Thomas	1	1	0
Robinson, Benjamin	0	5	0
Penrith.			
Kirkbride, William	0	5	0
Redfern, Tom	0	5	0
Wilson, Joseph	0	5	0
Penzance.			
Buckett, A. H.	0	5	0
Harvey, Joseph S.	0	10	6
Shakerley, Benjamin	0	5	0
Perth.			
Blair, R. P.	0	5	0
Donald, David	0	5	0
Newby, W. H.	1	1	0
Peterborough.			
Bridges, G. A.	0	5	0
Bright, Richard	0	10	6
Carlton, Arthur	0	10	6
Heanley, Marshall	0	10	6
Pearson, John H.	0	10	6
Sturton, J. R.	0	10	6
Willson, Stephen J.	0	10	6
Petersfield.			
Nichols, Frederic B.	0	5	0
Petherton.			
Wellington, Frederick G. N.	0	5	0
Petworth.			
Morgan, Frank G.	0	10	6
Pickering.			
Place, James A.	0	5	0
Robinson, G. D. R.	0	2	6
Pinner.			
Trist, Richard	0	5	0
Plymouth.			
Adams, W. T.	0	5	0
Allen, Joseph	0	2	6
Balkwill, A. P.	0	10	6
Ball, —	0	10	0
Barge, John	0	10	6
Bennett, R. M.	1	1	0
Burdwood, James	0	5	0
Eliott, Samuel	0	5	0
Goodwin, Medmer	0	10	6
Hearder, H. P.	0	10	0
Herron, T. T.	0	5	0
Hetherington, J. H.	0	5	0
Hill, Richard C.	1	1	0
James, John B.	0	10	6
Luke, R. S.	0	5	0
Marsh, John	0	5	0
Marshall, Charles W.	0	5	0
Maurice, James	0	10	6
Nicholls, S. J. H.	0	5	0
Rossiter, John	1	1	0
Saunders, R. A.	0	10	6
Sloggett, Thomas C.	0	5	0
Squire, F. J. C.	0	2	6
Starkey, G. T.	0	5	0
Steele, Samuel	0	10	6
Tatam, Samuel B. C.	0	5	0
Turney, Samuel B.	0	5	0
Williams, J. V.	0	10	6
Woods, William	0	10	0
Pocklington.			
Gordelier, Frank H.	0	5	0

Pontardulais.	£	s.	d.
Bowen, Ebenezer	0	10	6
Pontypool.			
Ford, Edward B.	0	10	6
Pontypridd.			
Key, W. H.	1	1	0
Poole.			
Penny, William	0	2	6
Williams, William F.	0	2	6
Porthcawl.			
Thomas, J. J.	0	2	6
Portishead.			
Frowd, Edward F.	0	10	6
Portobello.			
Kemp, David	0	10	6
Nesbit, John	1	1	0
Portsmouth.			
Parsons, William	0	10	6
Portsoy.			
Clark, James	0	5	0
Preston.			
Carter, James	0	5	0
Foster, E.	0	5	0
Goring, Richard	0	2	6
Hinkley, E.	0	2	6
Miller, Nathaniel	0	5	0
Parker, Thomas	0	5	0
Ryder, John L.	0	5	0
Scott, Joseph	1	1	0
Sharples, George	0	5	0
Smith, William	0	5	0
Tomlinson, John	0	10	0
Waterworth, Alfred	0	10	6
Willan, William	0	5	0
Prestwich.			
Mercer, A.	0	10	6
Ramsey (Hunts.).			
Palmer, Frederick W.	0	5	0
Ramsgate.			
Franks, Alfred	0	5	0
Morton, Henry	0	5	0
Saunders, Charles J. H.	0	2	6
Reading.			
Bradley, Charles	0	5	0
Cardwell, E.	0	10	6
Craft, James	0	5	0
Cross, John	0	2	6
Eminson, John M. O.	0	5	0
Hayward, William G.	0	5	0
Noad, Joseph	0	5	0
Powell, John	0	5	0
Rowell, John C.	0	5	0
Smith, Harry J.	0	2	6
Tunbridge, Frederick	0	5	0
While, William J.	0	5	0
Wilson, J P.	0	2	6
Young, J. M.	0	5	0
Reddish.			
Robinson, John T.	0	1	6
Redditch.			
Moule, William	0	5	0
Redhill.			
Shillitor, F. S.	1	1	0
Retford.			
Baker, William	1	1	0
Kirk, William P.	0	5	0
Rhondda Valley.			
Lloyd, Rees	0	5	0
Rhyl.			
Foulkes, William Henry	0	10	6
Rhymney.			
Dixon, Franklin	1	1	0

Richmond (Surrey).	£	s.	d.
Bletsoe, John	0	10	6
Clarke, Thomas M.	0	10	6
Hornby, Alfred	0	5	0
Lissiter, F. W.	0	2	6
Mumbray, R. G.	0	2	6
Parrott, John	0	10	6
Thacker, William	0	10	6
Richmond (Yorks).			
Thompson, John Thomas	0	5	0
Thompson, Thomas	0	10	6
Ringstead.			
Abington, Herbert J.	0	5	0
Ringwood.			
Bowring, John W.	0	5	0
Ripley.			
Morley, John T.	0	5	0
Rochdale.			
Highley, William	0	5	0
Robinson, Ralph	0	10	6
Taylor, Edward	0	5	0
Rochester.			
Barnaby, Henry	0	5	0
Foster, Alexander J.	0	5	0
Hewitt, Joseph S.	0	5	0
Rock Ferry.			
Dutton, John	1	1	0
Roehampton.			
Swain, James	0	5	0
Romford.			
Lasham, John W.	0	10	6
Pertwee, Edward	0	10	6
Romsey.			
Blissett, W.	0	10	6
Francis, George	0	5	0
Ross.			
Matthews, Thomas A.	0	5	0
Rothbury.			
Farrage, Robert	0	10	6
Rotherham.			
Horsfield, J. M.	0	5	0
Macaulay, William H.	0	10	6
Rotherfield.			
Field, William	0	5	0
Rothesay.			
Duncan, William	0	5	0
Macintosh, Archibald	0	5	0
Rugby.			
Brown, John	0	5	0
Chamberlain, A. G.	0	5	0
Lauder, Henry	0	5	0
Rugeley.			
Hawkins, Henry F.	0	10	0
Ruthin.			
Magin, Arthur E.	0	2	6
Ryde (Isle of Wight).			
Dixon, Henry	0	10	6
Flower, Thomas S.	0	10	0
Gibbs, William	0	10	6
Miller, Charles S.	0	5	0
Pollard, Henry H.	0	10	6
Smith, Tenison	1	1	0
Smith, William	0	2	6
Wallis, George	0	2	6
Rye (Sussex).			
Smith, Alfred W.	0	5	0
Waters, William A.	0	10	6
Saffron Walden.			
Machon, H.	0	15	0
St. Albans.			
Allenby, Henry	0	2	6
Ekins, Arthur E.	0	10	6
Martin, Henry G.	0	10	6
Myers, L. J.	0	5	0
St. Andrews.			
Cleghorn, Dr. H	0	10	0
Govan, Alexander	0	10	6
Kennedy, William	0	2	6
Kermath, W. R.	0	10	0
Kirk, John J.	0	2	6
St. Austell.			
Geldard, John	0	5	0
Smith, Albert	0	5	0
St. Blazey.			
Nettle, W. R. P.	0	5	0
St. Clears.			
David, Albert	0	2	6
Williams, Evan	0	10	6
St. Day.			
Corfield, Charles	0	10	6
Corfield, Thomas J. T.	0	10	6
St. Helens.			
Cotton, John, jun.	1	1	0
Harrison, James	0	5	0
Sherlock, Thomas	0	5	0
St. Just.			
Wearing, John	0	2	6
St. Leonards.			
Feaver, John	0	5	0
Field, H.	0	2	6
Joseph, Arthur I.	0	5	0
Maggs, F. W.	0	5	0
Maggs, Samuel B.	0	10	6
Neve, Francis C.	0	10	6
Thomas, Horace	1	1	0
St. Neots.			
Mellor, J. G.	0	5	0
Sale.			
Smith, Allen	0	5	0
Salisbury.			
Atkins, Samuel Ralph	0	10	6
Atkins, William R.	0	5	0
Hardy, R. E.	0	5	0
Newton, J. W.	0	10	6
Orchard, E. J.	0	10	6
Rowe, J	0	5	0
Westmoreland, W. H.	0	2	6
Saltash.			
Mathew, William H.	0	5	0
Saltburn-by-the-Sea.			
Taylor, William	0	5	0
San Remo (Italy).			
Squire, Frank R.	0	10	6
Sandgate.			
Jenner, William M.	0	5	0
Kennett, Edward	0	2	6
Walton, George C.	0	10	6
Sandwich.			
Baker, Frank	0	10	6
Dixon, William	0	5	0
Saundersfoot.			
Matthias, Thomas	0	10	6
Sawston.			
Crampton, John	0	5	0
Scarborough.			
Chapman, Henry	0	5	0
Clare and Hunt	1	1	0
Cuttle, Arthur E.	0	2	6
Eccles, H.	0	5	0
Jones, Alfred	0	5	0
Southwell, John W.	0	5	0
Whitfield, John	1	1	0
Scottow.			
Betts, George	1	1	0
Seacombe.			
Holt, Richard W.	0	5	0
Seaham Harbour.			
Storey, W.	0	5	0
Selby.			
Brown, George	0	5	0
Burton, John	0	5	0
Cutting, Thomas John	0	5	0
Selkirk.			
Dunn, Thomas	0	5	0
Settle.			
Shepherd, J. W.	0	5	0
Shaftesbury.			
Barry, Frederic	0	5	
Shanklin (Isle of Wight).			
Brown, Andrew Henry	0	10	6
Sheepshed.			
Moore, Thomas	0	5	0
Sheerness.			
Saffery, John	0	10	6
Sheffield.			
Bradwall, J. H.	0	2	6
Carr, George	0	5	0
Clark, John	0	10	6
Clayton, William	0	10	6
Cubley, G. A.	0	10	6
Dobb, Joseph T.	0	15	0
Dunnill, G. H.	0	5	0
Ellinor, George	0	10	6
Elliott, John G.	1	0	0
Fletcher, Howard Bennett	0	10	6
Fox, A. R.	0	10	6
Froggatt, John	0	2	6
Froggatt, F. W.	0	2	6
Furness, Joseph M.	0	5	0
Hall, Thomas H.	0	10	6
Harrison, Henry	1	0	0
Jervis, William	1	1	0
Jones, G. M.	0	5	0
Learoyd, E. R.	0	5	0
Miller, John T.	0	5	0
Newham, Benjamin	0	10	6
Otley, John	0	10	6
Owen, George	0	10	0
Preston, Job	0	10	6
Priestley, Henry	0	10	6
Salisbury, John M.	0	10	6
Turner, John	0	5	0
Ward, William	0	10	6
Watson, H. J.	0	5	0
Watson, Robert W.	0	10	6
Westbrook, Dr. Charles	1	1	0
Wilkinson-Newsholme, G. T.	1	1	0
Wood, Alfred	0	10	6
Shefford (Beds).			
Baigent, William Henry	0	10	6
Shepton Mallet.			
Cottrill, Gilbert Jones	0	5	0
Fudge, Charles William	0	5	0
Shields, North.			
Burn, Thomas	0	2	6
Gibson, James	0	10	6
Hogg, Joseph F.	0	2	6
Irvin, William G.	0	2	6
Stobbs, Robert	0	10	6
Wilson, Richard H.	0	2	6
Shields, South.			
Forrest, Robert	0	10	6
Mays, Robert J. J.	0	10	6
Noble, John	0	5	0
Raffle, William	0	10	6
Rowell, Robert	0	5	0
Williamson, Bamford	0	10	6
Shifnal.			
Clarke, Thomas E.	0	5	0
Shildon.			
Veitch, Thomas D.	0	5	0
Shoreham.			
Fenner, Edwin	0	5	0
Shrewsbury.			
Adams, William	0	5	0
Blunt and Moses	1	1	0
Cross, William G. and Son	1	1	0
Goucher, John	0	10	6
Goulbourne, William	0	5	0
Hickin, Henry	0	2	6
Jones, William	0	10	6
Longhurst, Edward	0	5	0
Pattison, Henry	0	2	6
Salter, Joseph B.	0	10	6

Sidcup.	£	s.	d.
Baker, William R.	0	5	0
Sidmouth.			
Chessall, Rowland	0	5	0
Silverdale.			
Wilson, Edward	0	5	0
Sittingbourne.			
Gordelier, William G.	1	1	0
Sleaford.			
Harrison, T. E.	0	5	0
Slough.			
Elliman, Samuel F.	0	10	6
Griffith, Richard	0	10	6
Smallthorne.			
Fletcher, Thomas	0	10	6
Snaith.			
Bean, John	0	10	6
Southam.			
Archer, Thomas	0	2	6
Southampton.			
Bates, William	0	2	0
Bienvenu, John	1	1	0
Bishop, Samuel	0	2	6
Borchert, Heinrich T. G.	1	1	0
British Pharmaceutical Conference	55	16	7
Culverwell. John S.	0	5	0
Dawson, Oliver R.	0	10	6
Fletcher. J. B.	0	10	0
Horsey, H. V.	0	2	6
Hughes, J. H.	0	5	0
Humby, Lewis W.	0	5	0
Mumford, Alfred	0	10	6
Pell, John	0	5	0
Randall, William B.	1	1	0
Spearing, James	0	10	6
Troake, C. F.	0	5	0
Southend.			
Dawson, George R.	0	5	0
South Molton.			
Cocks, James	0	2	6
Swingburn, Richard H.	0	10	6
Southport.			
Ashton, William	1	1	0
Ball, George	0	10	6
Bannerman, C. G.	0	2	6
Britten, Caroline	0	5	0
Ellis, George	0	5	0
Gillett, Joseph	1	1	0
Horsefall, John	0	10	6
Laslett, E. A.	0	12	0
Loadman, James	0	5	0
Mainwaring, R.	0	10	6
Moore, G. B.	0	5	0
Radley, William V.	0	10	6
Righton, James	0	5	0
Round, Frederick	1	1	0
Surr, Edward	0	5	0
Sykes, Thomas H.	0	10	6
Whitworth, James	0	10	0
Wimpenny, James M.	0	5	0
Wright, Thomas D.	1	0	0
Southsea.			
Cruse, Thomas H.	1	1	0
Ford, Horace S.	0	5	0
Futcher, Alfred J.	0	10	6
Parris, T. W.	0	5	0
Rowell, Robert H.	0	10	6
Sapp, John J.	0	10	6
Southwell.			
Downing, J. H.	0	5	0
Southwold.			
Critten, Robert P.	0	5	0
Sowerby Bridge.			
Stott, William	0	10	6
Spalding.			
Asling, Brelsford	0	5	0
Maxey, William H.	0	5	0
Spennymoor.			
Burden, Thomas A.	0	5	0
Spilsby.			
Steeper, Samuel	0	5	0
Stafford.			
Averill, Henry Alcock	1	1	0
Averill, John	1	1	0
Stalybridge.			
Simpson, Allwood	0	5	0
Stamford.			
Dickinson, Frederick	0	10	6
March, Frederick	0	5	0
Stanmore.			
Blackwell, S. J.	2	2	0
Stevenage.			
Fresson, Lewis Francis	0	10	6
Stirling.			
Duncanson, William	0	10	6
Stockport.			
Chemists' Association	1	1	0
Johnson, Thomas J.	0	5	0
Kay, Brothers	1	1	0
Lowndes, Hervey	0	5	0
Orton, William B.	0	2	6
Sidley, Thomas I.	0	10	6
Stockton, South.			
Ronchetti, T. A.	0	5	0
Stockton-on-Tees.			
Bainbridge, Robert R.	0	2	6
Brayshay, Thomas	1	1	0
Brayshay, William B.	1	1	0
Thompson, Thomas	0	10	6
Thomson Brothers	0	10	6
Stoke-on-Trent.			
Adams, Frank	0	10	6
Adams, William H.	0	10	6
Harris, E. A.	0	5	0
Jones, John	0	10	0
Walker, Thomas D.	1	1	0
Wilson, Clement Fisher	0	5	0
Stone (Staffs).			
Jenkins, Thomas H.	0	10	6
Slater, Thomas	0	10	6
Slater, Thomas, jun.	0	5	0
Stoneham.			
Sutton, Charles W.	1	1	0
Stonehouse.			
Daymond, Samuel	0	2	6
Netten, Henry J. T.	0	5	0
Snell, H. B.	0	5	0
Stony Stratford.			
Cox, Julia Jane	0	10	6
Robinson, William H.	0	10	6
Stourbridge.			
Bland, Thomas F.	0	10	6
Burgess, William	0	5	0
Clark, Thomas P.	0	5	0
Hughes, Samuel	0	10	6
Jones, Rowland G.	0	5	0
Loverock, Henry	0	10	0
Morris, Alfred P.	0	10	6
Perks, Francis	0	10	6
Whitwell, George	0	5	0
Stowmarket.			
Gostling, George J.	0	10	6
Simpson, Robert G.	0	5	0
Wilson, Thomas	0	5	0
Stratton.			
Pickard, Henry	0	5	0
Strichen.			
Lee, Alexander M.	0	5	0
Strood.			
Picnot, Charles	1	1	0
Stroud.			
Blake, William Frederick	0	10	6
Coley, Samuel J.	0	10	6
Smith, David	0	10	
Sunbury-on-Thames.			
Truman, H. V.	0	2	6
Sunderland.			
Fairman, George P.	0	10	6
Harrison, John	0	10	0
Harrison, W. B.	0	10	0
Hopper, Richard	0	2	6
Leadbetter and Son	0	2	6
Mitchinson, John	0	2	6
Purse, Alfred D.	0	5	0
Surbiton.			
Acfield, William	0	5	0
Mence, W. C.	0	10	0
Sutton Coldfield.			
Smith, William	0	10	6
Sutton-in-Ashfield			
Littlewood, Samuel	0	5	0
Swaffham.			
Bell, Frederick R.	0	5	0
Finch, Jacob	1	1	0
Swansea.			
Bonnett, Frederick	0	2	6
Cule, Taliesin	0	10	6
Davies, John	0	5	0
Davies, John	0	10	6
Davies, John	0	2	6
Davies, J. M.	0	5	0
Grose, Nicholas M.	0	10	6
Hughes, James	0	5	0
Jones, H. Ellis	0	2	6
Jones, Moses	0	10	6
Lloyd, John W.	0	5	0
Rees, Daniel	0	5	0
Richards, J.	0	5	0
Roberts, J. H.	0	5	0
Trick, M	0	5	0
Williams, D.	0	2	6
Yorath, Christopher	0	10	6
Sydney (N.S.W.).			
Sloper, Frederick E.	2	2	0
Tarporley.			
Aston, Walter	0	5	0
Taunton.			
Biffen Thomas	0	10	6
Dyer, E. H.	0	5	0
Field, W. C.	0	5	0
Gregory, George H.	0	5	0
Hambly, Charles J.	0	10	6
Kirkpatrick Samuel	0	5	0
Redman, Sidney	0	5	0
Sargent, John C.	0	10	6
Woollatt, Richard	0	5	0
Tavistock.			
Gill, William	0	2	6
Teignmouth.			
Cocking, Frederick J.	0	5	0
Cornelius, Joseph	0	10	0
Evans, Joseph J. O.	0	5	0
Pryer, H.	0	5	0
Tenbury.			
Slade, John	0	10	6
Tenby.			
Davies, Moses P.	0	5	0
James, George	0	5	0
Williams, William	0	5	0
Tewkesbury.			
Allis, Francis	0	5	0
Walker, Joseph	0	5	0
Wilkes, D. T.	0	2	6
Thame.			
Sutton, W. D.	0	5	0
Thirsk,			
Smithson, F. W.	0	2	6
Thornhill (N.B.).			
Fingland, James	0	5	0
Thornton Heath.			
Knott, Samuel	0	5	0
Thornton-in-Craven.			
Wilson, Thomas	1	1	0

Thrapston.	£	s.	d.
Pars, R. C.	0	10	6
Titchfield.			
Smith, W. O.	0	10	6
Tiverton.			
Havill, Paul	0	5	0
Rossiter, Thomas E.	0	5	0
Sanders, George Lee	0	5	0
Todmorden.			
Stevenson, W.	0	2	6
Torquay.			
Bathe, William	0	5	0
Bridgman, William Louis	0	5	0
Cocks, John W.	0	5	0
Guyer, James B.	1	0	0
Knight, Benjamin	0	5	0
Ness, Thomas H.	0	2	6
Riches, Thomas	0	5	0
Shapley, Charles	0	10	0
Sloman, Richard	0	10	6
Smith, Edward	0	10	6
Taylor, John	0	10	6
Totnes.			
Michelmore, P. W.	0	5	0
Morse, C. H. Stafford	0	5	0
Tredegar.			
Giles, William E.	0	2	6
Phillips, Charles L.	0	5	0
Treherbert.			
Jones, Rees T.	0	2	6
Trowbridge.			
Hayward, W. H.	0	5	0
Truro.			
Anstey, J. U.	0	5	0
Bird, Matthew M.	0	5	0
Bucher, W. H.	0	5	0
Feaver, Samuel	0	10	6
Percy, Thomas B.	1	1	0
Tunbridge.			
Gower, Alfred	0	10	0
Millidge, Thomas E.	0	10	6
Wibmer, Lewis Michael	0	5	0
Tunbridge Wells.			
Arnold, Spencer	0	10	6
Batting, Thos. G.	0	10	6
Cheverton, George	1	1	0
Dunkley, Edward	0	10	6
Howard, George W.	0	10	6
Howard, Richard	0	10	6
Mason, Michael	0	5	0
Sells, Robert J.	0	10	6
Whitrow, Benjamin	1	1	0
Tunstall.			
Keightley, Joseph	0	5	0
Tweedmouth.			
McIntyre, Peter S.	0	7	6
Twickenham.			
Alexander, William	0	5	0
Amoore, Lewis P.	0	10	6
Bishop, Thomas	0	10	6
Peake, Henry F.	0	5	0
Shelley, Henry	0	10	6
Tynemouth.			
Atkinson, Joseph	0	5	0
Uckfield.			
Salter, Benjamin	1	1	0
Ulverston.			
Downward, John	1	1	0
Willan, Robert	0	5	0
Uppingham.			
Killick, C. R.	0	5	0
Upton-on-Severn.			
Gibbs, John	0	10	6
Urmston.			
Duncalf, Richard	0	5	0
Uttoxeter.			
Johnson, John B.	0	10	6
Parker, Alfred	0	5	0
Woolrich, Charles B.	0	10	6

Ventnor (Isle of Wight).	£	s.	d.
Starling, Henry W.	0	5	0
Weston, Charles	1	1	0
Victoria (British Columbia).			
Jones, Hugh Lloyd	1	1	0
Wakefield.			
Cardwell, James	0	5	0
Chaplin, John Lambert	0	10	6
Clarkson, B. F.	0	5	0
Duffin, Thomas	0	10	6
Hudson, Frank	0	5	0
Ibbotson, Fred	0	5	0
Moorhouse, Walter	0	5	0
Quarmby, J. A.	0	5	0
Saville, George	0	5	0
Smith, G. E.	0	10	6
Wice, J. H.	0	10	6
Wallingford.			
Ashmall, George	0	5	0
Payne, Sidney	1	1	0
Upton, Eustace J.	0	10	0
Walmer.			
Wood, Henry	0	5	0
Walsall.			
Bate, Joseph William	0	5	0
Elliott, George	0	5	0
Partington, John J.	0	5	0
Walsham, North.			
Denney, E. J.	0	10	6
Walsham-le-Willows.			
Harrington, Arthur	0	2	6
Waltham.			
Teat, Thomas	0	5	0
Waltham Abbey.			
Griffiths, J. M.	0	10	6
Marshall, A.	0	10	6
Walton-on-Thames.			
Davies, C. E.	0	5	0
Power, Edward	0	5	0
Wantage.			
Candy, J. W. G.	0	5	0
Marks, F. C.	0	5	0
Ware.			
Medcalf, Benjamin	0	10	6
Medcalf, Benjamin Pearce	0	10	6
Wareham.			
Marshallsay, Richard J.	0	5	0
Randall, Thomas	1	1	0
Warminster.			
Rogers, John M.	0	2	6
Rogers, Sydney	0	2	6
Warrington.			
Greenough, H. F.	0	2	6
Woods, J. H.	0	10	6
Young, John R.	0	10	6
Waterford.			
Goodchild, Thos. A.	0	5	0
Watford.			
Chater, Edward M.	1	1	0
Chater, Matthew Taylor	1	1	0
Cottle, Alfred James	0	5	0
Maries, H. D.	0	5	0
Wath-upon-Dearne.			
Hick, Allan	1	1	0
Watton.			
Vincent, Lacey A.	0	5	0
Weaverham.			
Manifold, John J.	0	10	6
Wednesbury.			
Gittoes, Samuel J.	0	10	6
Welshpool.			
Williams, Thomas	0	5	0
Wells (Norfolk).			
Mann, George F.	0	5	0
Rump, Robert R.	0	5	0

Wells (Somerset).	£	s.	d.
Manning, Richard James	0	10	6
Slater, Jonathan	0	5	0
Welton.			
Myers, George Henry	0	5	0
Welwyn.			
Lawrance, Edmund	0	10	6
Wem.			
Bailye, W. R.	0	10	6
West Bromwich.			
Bullus, John	0	5	0
Haddock, Benjamin	0	10	6
Tunley, John	0	5	0
Westbury.			
Taylor, Stephen	0	2	6
Westbury-on-Trym.			
Collie, John C.	0	5	0
Westgate-on-Sea.			
Hutchinson, George B.	0	5	0
West Malling.			
Oliver, Henry C. H.	0	5	0
Stedman, Richard B.	0	5	0
Wetherby.			
Jackson, John	0	5	0
Weybridge.			
Griffin, Thomas	0	10	6
Weymouth.			
Cole, W. B.	0	5	0
Gregory, William	0	5	0
Groves, Thomas B.	0	10	6
Hill, Henry	0	5	0
Livesey, James T.	0	2	6
Smith, Joseph	0	5	0
Stedman, Samuel S.	0	10	0
Targett, Charles G.	0	5	0
Whitby.			
Corner, Thomas B.	0	10	6
Frank, John	1	1	0
Sewell, Edward E.	0	2	6
Stevenson, John	0	10	6
Whitechurch (Hants).			
Bailey, John H.	0		
Whitehaven.			
Wilson and Kitchin	1	1	0
Wick (N.B.).			
Miller, Kenneth	0	5	0
Wigan.			
Dawson, Francis Robert	0	5	0
Hothersall, John	0	10	6
Johnson, Thomas	0	10	6
Kellett, Richard E.	0	5	0
Mather, John	0	5	0
Phillips, Jonathan	0	10	6
Wilmslow.			
Charnley, Charles	0	10	6
Wimbledon.			
Dowdeswell, Jonathan	0	5	0
Fuller, R. T. C.	0	10	6
Spencer, W. G.	0	5	0
Wimborne.			
Jones, Henry	0	10	6
Winchcombe.			
Hall, Alfred L.	0	5	0
Winchester.			
Barratt, F. J.	0	5	0
Knight, George E. Moses	0	5	0
Powell, Edward	1	1	0
Powell, Edward F.	0	10	6
Windsor.			
Collins, Henry G.	0	5	0
Grisbrook, Edward	0	5	0
Harmer, J. D.	0	5	0
Leigh, John	0	10	0
Russell, Charles J. L.	0	10	6
Westlake, Bernard	0	10	6
Wood, Robert	0	5	0

Wingham.	£	s.	d.
Palmer, Henry B.	0	5	0
Winnebah (Africa).			
Jones, Thomas	1	7	4
Winslow.			
Parrett, Edward	0	5	0
Wisbeach.			
Maxey, John T.	0	5	0
Witham.			
Green, Robert P.	0	10	6
Ward, Francis E.	0	5	0
Witney.			
Purdue, Thomas	0	5	0
Wokingham.			
Spencer, Thomas	0	10	6
Wolverhampton.			
Cannell, William	0	10	6
Coleman, William	0	10	6
Fleeming and Son	0	10	6
Gibson, F. J.	0	5	0
Hamp, John	0	5	0
Stanway, Edward Thomas	0	10	6
Weaver, Alfred C.	0	5	0
Woodbridge.			
Betts and Son	0	10	6
Worboys.			
Nichols, Arthur F.	0	2	6

Worcester.	£	s.	d.
Ferneley, Charles	0	10	6
George, Henry	0	10	6
Hall, Frederick J.	0	5	0
Hinks, John	0	10	6
Hogg, James E.	0	5	0
Horniblow, W. T.	0	5	0
Kitson, Edward J.	0	10	6
Lunn, Thomas	0	10	6
Masters, Charles	0	5	0
Steward, John A.	0	10	6
Timms, Mrs.	0	10	6
Twinberrow, John	1	1	0
Virgo, Charles	1	1	0
Workington.			
Bowness, William	0	5	0
Mason, Joseph R.	0	5	0
Worksop.			
Baxter, George	0	5	0
Hadfield Henry M.	0	5	0
Jones, George W.	0	5	0
Worthing.			
Chaplin, Alfred	0	10	6
Cortis, A. B.	1	11	6
Wrotham.			
Romans, Thomas W.	0	10	6
Wycombe.			
Furmston, S. C.	0	5	0
Harding, Robert	0	5	0
Lansdale, John A.	0	5	0
Mawer, Edward	0	5	0

Wyke.	£	s.	d.
Drake, William	0	5	0
Wymondham.			
Skoulding, William	0	5	0
Yarm.			
Reed, George	0	10	6
Yarmouth.			
Mornement, Henry J.	0	5	0
Poll, W. S.	0	2	6
Pratt, Edward J.	0	5	0
Skoulding, George S. F.	0	10	6
Steward, Alfred	0	5	0
Welch, Alfred E.	0	5	0
Yaxley.			
Farr, Joseph	0	10	6
Yeadon.			
Blatchley, Thomas	0	10	6
Yeovil.			
Harwood, Henry T.	0	10	6
York.			
Batty, Thomas	0	5	0
Capes, John Henry Cooper	0	5	0
Croskell, C.	0	10	6
Davison, Ralph	0	10	6
Leak, Frederick	0	10	0
Parker, Thomas	0	5	0
Saville, John	1	1	0
Wand, Thomas	0	5	0
Wilson, Thomas W.	0	5	0

DONATIONS RECEIVED DURING 1882.

	£	s.	d.
Bird, Augustus, Wood Lane, Shepherd's Bush, London, W.	10	10	0
Bishop, Alfred, 17, Speck's Fields, Mile End, London, E.	68	5	0
Buck, Thomas, Stamford Hill, London, N.	5	5	0
Burden, Edward M'Mullen, 38, Duke St., Grosvenor Sq., London, W.	10	10	0
Burnell, John S., Glossop Road, Sheffield	5	5	0
Butt, E. Northway, 13, Curzon St., Mayfair, London, W.	52	10	0
Cuff, J. H., 291, Camden Road, London, N.	5	5	0
Davenport, J. T., 33, Great Russell Street, London, W.C.	5	5	0
Evans, Sons & Co., 56, Hanover Street, Liverpool	10	10	0
Fennings, Alfred, Salus Villa, West Cowes, I.W.	5	10	0
Kemp, D. S., Bombay	5	5	0
Lee, William, High Street Honiton	10	10	0
Richardson, J. G. F., Stoneygate, Leicester	50	0	0
Robbins, John, 147, Oxford Street, London, W.	106	16	0
Scruby, W. Y., Acton, W.	5	5	0
Searle, George G., Fakenham, Norfolk	5	5	0
Squire, William, 5, Coleman Street, London, E.C.	10	10	0
Stooke, Arthur, King Street, Milton next Sittingbourne	5	5	0
Thorburn, Henry W., Cradock Villa, Bishop Auckland	5	5	0
W. S., Dover	5	5	0

LEGACIES RECEIVED DURING 1882.

Howden, Robert	£100	0	0
Lloyd, Arthur	100	0	0
Pearson, Charles James	100	0	0

ANNUITANTS.

There are at present *forty-one* annuitants, receiving £1350 per annum, and casual relief is also granted, involving a total annual expenditure of upwards of £1800.

The scale of pensions is £30 per annum to pensioners under 65 years of age, and £35 per annum to pensioners 65 years of age and upwards.

ABSTRACT OF RULES IN REFERENCE TO VOTES AT THE ELECTIONS OF ANNUITANTS.

Annual Subscribers of—Half-a-crown are entitled at each election of Annuitants to ONE Vote.
Five Shillings ... ... TWO Votes.
Half-a-guinea ... ... FIVE Votes.
One Guinea ... ... TEN Votes.
And to increase in the same proportion.
Five Guineas are entitled to ... ... FIVE Votes for life.
Ten Guineas ... ... TEN Votes for life.
And to increase in the same proportion.

Should any Subscriber or Donor, or the widow of any Subscriber or Donor, become a Candidate for an annuity, such number of votes shall be placed to his or her credit, at the first succeeding election, as shall be represented by the whole amount of subscriptions or donations to the Benevolent Fund he or she (or, in the case of a widow, her husband) may have contributed.

Cheques and post office orders to be made payable to ELIAS BREMRIDGE.

FORM OF BEQUEST TO THE BENEVOLENT FUND.

"*I give and bequeath the sum of* *unto the* PHARMACEUTICAL SOCIETY OF GREAT BRITAIN, *the same to be paid out of my pure personal estate, and to be applied for the purposes of the* BENEVOLENT FUND *of the said Society.*"

N.B.—Devises of land and bequests of money savouring of realty, or, in other words connected in any way with land, will be void.

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Concentrated Liquors.

Universally acknowledged by Pharmacists who have them in use, to be the most **Simple, Efficient and Economical** of all methods for preparing Syrups.

SYRUPS made with **FLETCHER'S CONCENTRATED LIQUORS** are always

Uniform in Strength and Brilliant in Appearance,

and can be obtained at a fraction of the cost of Syrups manufactured by any other process.

FLETCHERS' CONCENTRATED LIQUORS have gained a world-wide celebrity, and may be obtained from our accredited Agents in every quarter of the Globe.

To enable those who are not yet personally acquainted with the **Liquors** to satisfy themselves as to their value, **by actual experiment,** we offer to send, *on receipt of a post card,* to

EVERY CHEMIST AND DRUGGIST

Whose Name appears on the Register, whether residing

AT HOME OR ABROAD,

free of expense, and carriage paid, a sufficient quantity of any selected **LIQUOR** to produce four ounces of the corresponding Syrup.

In thanking our friends for the liberal support which has contributed to the unprecedented success of our preparations, we beg to direct attention to our

LIST OF NEW LIQUORS,

which will be posted free on application. These latest additions combine the many excellent qualities which have rendered the previous series of **CONCENTRATED LIQUORS** so deservedly popular.

FLETCHER, FLETCHER & STEVENSON,
Holloway, London, N.

THE "PET" FEEDING BOTTLE

Is now made in the following styles:—

SIXPENNY SIZE.

			per doz.
No. 1.	...	Upright shape, green glass, white fittings	3/6
„ 6.	...	Bent neck, white fittings	3/6
„ 10.	...	Bent neck, screw glass stoppers	4/-

With black fittings, 3/- gross extra.

ONE SHILLING SIZE.

No. 13.	...	Bent neck, pot caps, *white flint* glass	7/-
„ 15.	...	Do. *all rubber fittings,* do.	8/-
„ 17.	...	Do. screw glass stoppers, white flint	7/-
„ 19.	...	Do. screw metal caps, do.	7/-

All in handsome boxes with *two brushes.* With black fittings, 1/- dozen extra.

ONE SHILLING AND SIXPENNY SIZE.

No. 20.	...	Bent neck, gilt metal cap, &c., black fittings	12/-
„ 21.	...	Do. gilt china cap, do.	12/-
„ 22.	...	Do. screw glass stopper, do.	10/6

All with pure rubber fittings. Tube and bottle brush, spare tube and teat, in extra strong box, handsomely labelled.
Price list of other patterns on application.

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A new remedy for Neuralgia. For outward application.
Very saleable.
Per doz. 4/- 8/-

JAPANESE "CURL" PAPER.

500 sheets in packet.
Per doz. ... 4/- As soft as silk.

POROUS PLASTERS.

Poor Man	per doz.	2/-
Chest Plasters, Roborans	„	2/-
„ „ (Belladon)	„	2/6

CORKS.

100 gross in a bag. Per gross, 4d. net.

ANTISEPTIC INHALER.

Nickel-plated, with hinged front for Medicated Wool.
Per doz. 16/-

THROAT SPRAY.

Glass, with india-rubber ball and tube.
Per doz. 27/-

DR. SYMES' PILL COATER

Will coat with ease and rapidity ½ lb. of Pills. Each 4/6.
Saves its cost at once.

FOLDING CASES.

For wrapping medicine bottles.

4/-	4/6	5/-	5/6	6/- per gross.
2	3	4	6	8-oz.

CARDED SPONGES,

TURKEY OR HONEYCOMB.

FREE FROM SAND. NO LOSS OR WASTE. ONE DOZ. ON A CARD.

Per doz. ...	-/8	1/4	2/-	2/8	4/-	8/-	12/-	16/-	20/-	40/-
To sell at ...	-/1	-/2	-/3	-/4	-/6	1/-	1/6	2/-	2/6	5/-

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(BOURNE & TAYLOR)

35, CASTLE STREET, HOLBORN, E.C.

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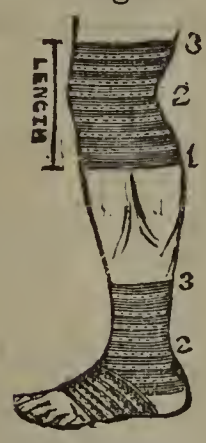
The only Award at The Medical and Sanitary Exhibition, South Kensington, 1881, for Spiral Appliances, Elastic Stockings, and India rubber Urinals (over all other Exhibitors).

Spiral Knee-Cap and Spiral Sock.

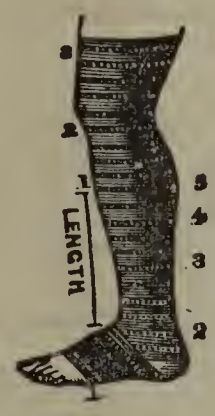
Fig. 2.



From 6s. to £1 1s.

Spiral Stocking and Knee-Cap combined.

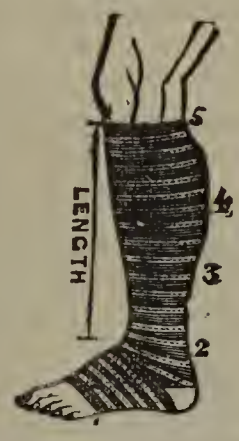
Fig. 5.



From £1 1s. to £2 12s. 6d.

Spiral Stocking.

Fig. 3.

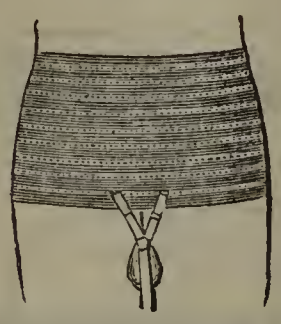


From 10s. to £1 11s. 6d.

Spiral Belt and Air Pad.

For Prolapsus Uteri or Ani.

Fig. 11.

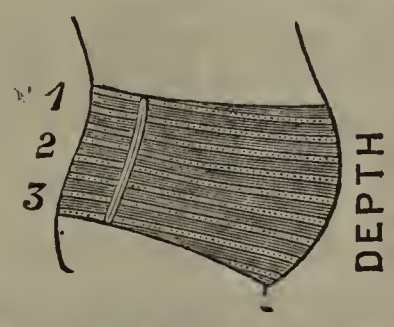


From £2 2s. to £4 4s.

Air Pad with ordinary waist-band, for Prolapsus Uteri or Ani, £1 1s.

Spiral Abdominal Supporter.

Fig. 12.



From £1 11s. 6d. to £3 13s. 6d.

Spiral Abdominal Belt.

For Umbilical Hernia.

Fig. 10.

From £2 2s. to £4 4s.

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All Orders from Chemists and Druggists are subject to 25 per cent. discount.

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AND

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do. On black or white waterproof, 12s. per doz.

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" " **Cotton Wool**, in 1 oz. and 2 oz. boxes, 3s. 6d. and 6s. 6d. doz.

" " " per lb., 2s.

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Pink	2s. 6d.	36s. 0d.	Golden	2s. 6d.	34s. 6d.
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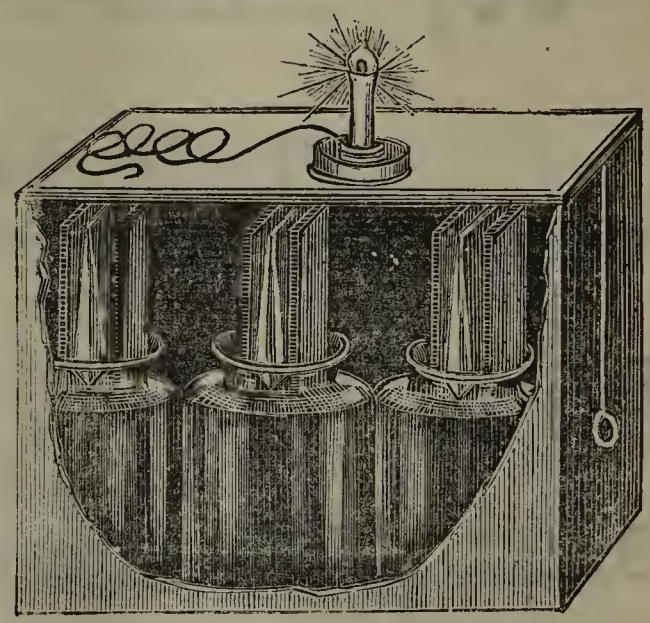
LIGHT AND POWER

25/- BATTERY. 25/-



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Vide *The Lancet*, Jan. 11th, 1879; *British Medical Journal*, Feb. 8th, 1879; *Medical Times and Gazette*, April 12th, 1879.

Extract of Letter received from J. F. FINCHETTE, Esq., Portland House, Brunswick Square, W., dated February 18th, 1879.

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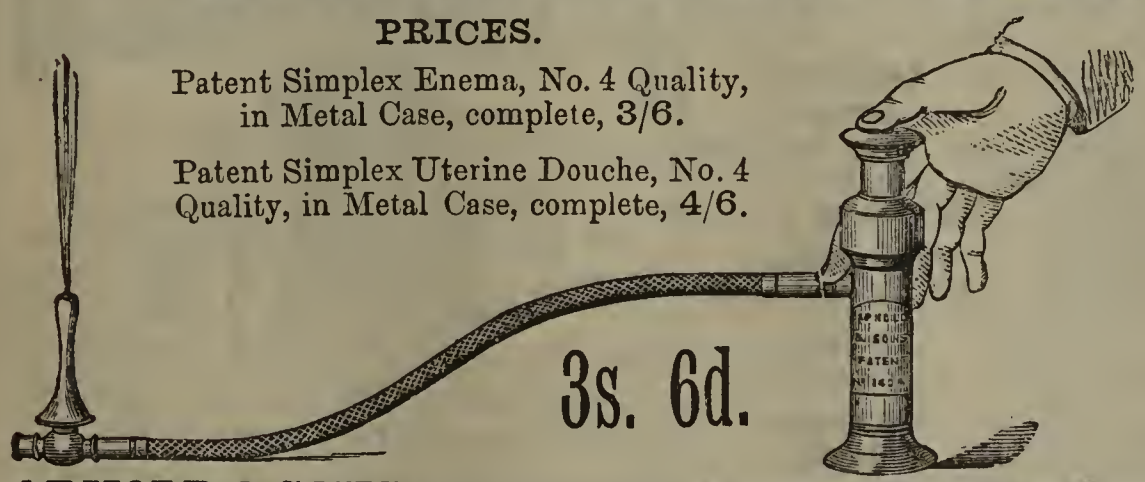

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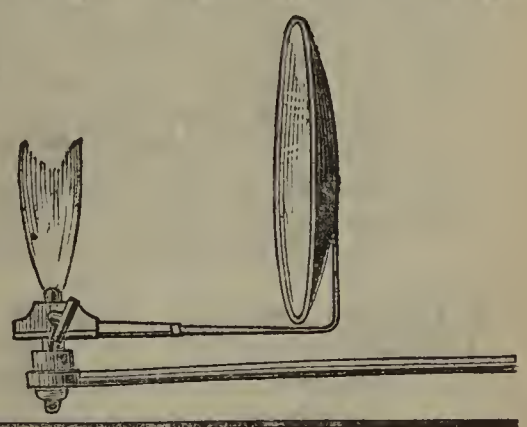

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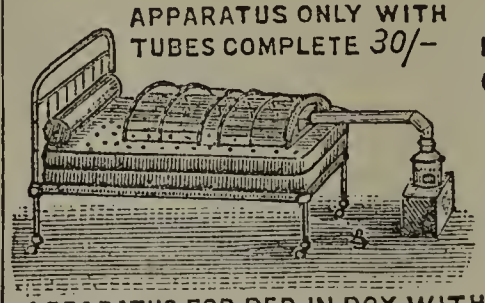

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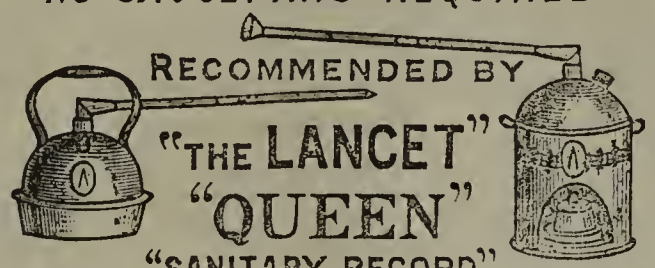

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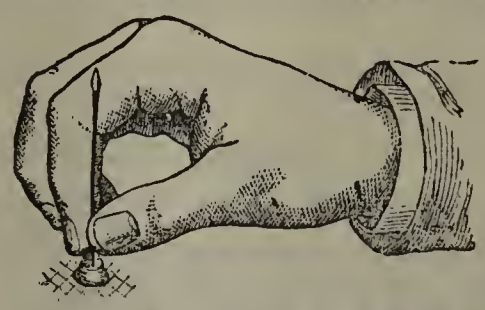

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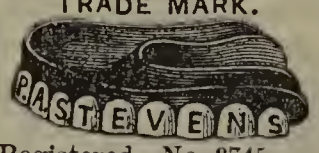

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45, Gifford Street, LONDON, N., and Montpellier Gardens, HARROGATE.

10 per Cent. Discount on all Natural Waters (See List, post free).

1.—Because, taking into consideration *the superior quality* and the style in which the Waters are got up, they are *cheaper* than any supplied by other Manufacturers.

2.—Because *none but Chemists (Shareholders) can purchase the Waters direct*; consequently, when a Chemist has created a sale, he *cannot be undersold by Grocers*; whereas, if he purchase from other manufacturers, he will generally find that if he succeed in establishing a ready sale for *any* brand, the *same* Waters will soon be found to be offered by Grocers, Wine Merchants, &c., in his locality, at a lower price than that at which he can afford to sell.

3.—Because the Waters are acknowledged to be of the first and purest quality, being carefully filtered, and passed through silver-lined machinery, thereby preventing the possibility of any contamination whatever with injurious metals.

4.—Because, in addition to the ordinary Waters, Soda, Potash, and Lithia Waters can be obtained of B.P. strength, and every Chemist should stock some of these, as when Waters are ordered to be taken medicinally, B.P. preparations should always be supplied.

N.B.—At the Food Exhibition, Agricultural Hall, 1881, the Association's B.P. Waters obtained the only Prize Medal, and at Bradford Exhibition, 1882, the Highest Medal was awarded.

5.—Because goods are invariably despatched on same day as order received, carefully and well packed in strong bin cases, thereby preventing breakage in transit. Town goods are delivered by the London Parcels Delivery Company, Limited, and empties collected free.

6.—Because the best Syphons, with tops, manufactured from the purest tin, are used; also first-class ordinary bottles, carefully wired and labelled, and corked with superior corks.

7.—Because the labels state the exact strength of the Waters—an essential for Chemists' Trade.

8.—Because every Chemist who joins is assisting in making the Association Waters famous, and is consequently helping his brother Chemist, while advancing his own interests.

9.—Because Chemists will learn what great power they possess when combined, and how well they stand in competition with other tradesmen, provided only they are loyal to each others' interests.

10.—Because already **600** Chemists have joined, and PROVED that they derive considerable benefit from combination.

11.—Because "ÆSCULAP" can be purchased in original packages by the Shareholders on very advantageous terms. CARRIAGE PAID to any part of the Kingdom.

12.—Because Seltzogenes of first quality can, when required, be obtained for members at a liberal discount.

13.—Because **600** Chemists ask you to join with them.

14.—Because the larger the combination, the larger the dividends.

15.—Because all **NATURAL MINERAL WATERS** can now be purchased through the Association at *cheaper rates* than can be procured elsewhere.

PRICES.

TO CHEMISTS ONLY.

	At per doz. s.	d.
Carbonated Water	1	0
Soda ,, 5 grains to the ½-pint	1	0
Soda ,, B.P. 15 ,,	1	0
Potash ,, 5 ,,	1	0
Potash ,, B.P. 15 ,,	1	0
Seltzer ,,	1	0
Lemonade	1	3
Lime Juice	1	3
Ginger Ale	1	3
,, Super	1	6
Nectar	1	3
Ginger Beer, Glass	1	3
Lithia ,, B.P. 5 grains	1	9
Lithia and Potash Water	1	9
Iron and Quinine Water	1	9
Mineral Acid ,,	1	9
Champagne Bottles. Sparkling Rubine, quarts	5	9
,, ,, ,, 6 doz.	5	6
,, ,, ,, 30 doz.	5	3
,, ,, ,, 200 doz.	5	0
,, ,, ,,	5	0
,, ,, pints	4	0
,, ,, ,, 6 doz.	3	10
,, ,, ,, 30 doz.	3	8
,, ,, ,, 200 doz.	3	5
Kissengen, Harrogate, pints	4	6
,, ,, quarts	6	0
Sulphur, Harrogate, Strong, quarts	5	0
,, ,, Mild	5	9

DISCOUNT ALLOWED ON PREPAYMENT.

SYPHONS.

	At per doz. s.	d.
Carbonated Water	1	6
Soda ,, 10 grains to the pint	1	6
Soda ,, B.P.	1	6
Potash ,, 10 grains to the pint	1	6
Potash ,, B.P.	1	6
Seltzer ,,	2	0
Lithia ,,	2	6
Lithia and Potash Water	2	6
Iron and Quinine ,,	2	6
Mineral Acid ,,	2	6
Lemonade ,,	2	6
Lime Juice	2	6
Doz. Bottles	1	6
,, ,, Patent	3	0
,, Syphons	24	0
3 doz. Cases	3	6
4 ,,	4	6
6 ,,	5	6
1 ,, (Syphons)	2	6
3 ,, Acme Cases	2	6
6 ,, ,,	3	6

10 per Cent. Discount on all Natural Waters (See List, post free).

PRICES OF MINERAL WATERS, 1883.

MESSRS.

E. GALLAIS & CO.'S

OF

27, MARGARET ST. REGENT ST. W.

Best terms for all Mineral Waters are 7½ % for cash, and 5 % for quarterly accounts, except APOLLINARIS and HUNYADI, which are supplied on same terms as the Apollinaris Company.

Rubinat Aperient Water. 25 *quarts for* 28*l*- *and* 12 *quarts gratis for distribution on the first transaction.*

TRADE

MARK

HOOPER'S
BRIGHTON SELTZER

Per 2s. 6d. doz.

SIX DOZEN CARRIAGE FREE.

Special Terms for Quantity.

HOOPER AND COMPY.

Manufacturers and Importers of Mineral Waters,

7, PALL MALL EAST, LONDON.

Æsculap

A POSITIVE CURE
FOR
STOMACH, LIVER & KIDNEY AFFECTIONS.

The Only Palatable Natural Aperient Water.

THE BEST HOUSEHOLD REMEDY & SPECIFIC FOR CONSTIPATION

Highest Award at the International Medical Exhibition, 1881. Retail 1/6 & 2/- per Bottle.

A SUPPLY OF CIRCULARS WITH NAME AT FOOT AND DESCRIPTIVE PAMPHLETS FREE ON APPLICATION.

Chemists can safely stock this Water, as it will continue to be well advertised.
It is prescribed by all the leading Medical Men.

ÆSCULAP BITTER WATER COMPANY, Limited, 38, Snow Hill, LONDON, E.C.

PITKEATHLY WATER

(REGISTERED)

REID & DONALD, CHEMISTS, PERTH,

Is an EFFERVESCENT MINERAL WATER, having Tonic, Refreshing, and Stimulating Properties, also possessing valuable dietetic qualities, and specially adapted for mixing with Wines and Brandies.

The following are some of the Testimonials which have been received from Physicians as to the Therapeutic properties of the Water:—

From ————, Esq., M.D.

DEAR SIRS,—I have intended for the last week or two writing you a reply to your letter, in which you ask me to say what I think of Pitkeathly Water. Well, I think I told you before that after a fair trial I think it a most agreeable beverage for table use, either by itself or in combination with wines or spirits, particularly the latter. Unlike all other Saline and Aërated Waters I have experience of, it is not depressing, but tonic in its effects. I presume, from the small quantity of ferric oxide it contains, this tonic action is chiefly felt in the bladder and bowels. It is a powerful diuretic, and produces profuse discharge of lithates, and taken in large doses promotes the action of the liver and is aperient. On considering its composition as seen in the most recent analysis, and its therapeutic action, it struck me as being likely to be of great service in gouty and rheumatic diatheses, and experience has now confirmed this. I know of no better anti-gouty and anti-rheumatic mineral water; nor do I know of any better beverage for old men who have bladder catarrh and enlarged prostrate, and in women I have found it equally soothing and curative in similar conditions.

17th January, 1882.

From JAMES NEILSON, Esq., M.D., Edin.

Pitkeathly Water in the aërated form, prepared by Messrs REID & DONALD, Perth, is sparkling and pleasing in taste. Taken with wines or cognac as a diluent, the effect is pleasant and agreeable. Being composed principally of magnesium and calcium, the best known absorbers of caloric, this water prevents the destructive action of alcohol on the mucous membrane of the stomach, thereby acting as a corrective as well as an agreeable and refreshing beverage.

BLAIRGOWRIE, 30th Oct., 1881.

From ANDREW BUIST, Esq., M.D., and Fellow of the Royal College of Surgeons, Edin.

I have frequently prescribed the Pitkeathly Waters. as aërated by Messrs REID & DONALD, Chemists, Perth, on account of their exhilarating and tonic qualities, with the greatest benefit to my patients.

ATHOLE CRESCENT, PERTH, 3rd March, 1880.

From ALEXANDER THOM, Esq., M.A., M.D., Edin.

I have made trial of the Pitkeathly Natural Waters, as aërated by Messrs REID & DONALD, and have much pleasure in bearing testimony to their efficacy. Apart from their utility, I find that they are hailed with much satisfaction by patients. So palatable are they in the aërated form that they compare most favourably with even the best Seltzers, and, indeed, as a vehicle for stimulants at meal-times for patients who require such, few waters equal them.

CRIEFF, May, 1881.

From JAMES LAING, Esq., M.D., L.R.C.S.E.

After forty years' experience in the use of Pitkeathly Water, I can testify to its beneficial effects in the following:—

In habitual constipation, and in the sluggishness induced by such a habit in the digestive organs generally, the Pitkeathly Water is very useful as a mild aperient.

In plethoric states of the system, with tendencies to congestion of the brain, lungs, &c.

In chronic affections of the organs of respiration and circulation when there is a tendency to congestion.

In gastric derangement, arising from error in diet or undue indulgence in food or drink. In its aërated state the Water suits the most irritable stomachs, and acts as a powerful adjuvant to other saline and diuretic remedies—greatly increasing their action and efficacy.

In diseases of the liver, accompanied by disturbance of the biliary function, the Pitkeathly Water liquefies the secretion and stimulates the excretion of the bile, and removes congested states of that organ, &c.

In the various forms of eczema it seldom fails to effect a cure if its use is sufficiently persevered in, and in many other chronic skin eruptions it is highly beneficial.

In most cases of gout and rheumatism it has also proved highly efficacious.

BRIDGE OF EARN.

From JAMES MACKENZIE, Esq., M.D., Edin.

From the analytical report on the Water from the Mineral Wells of Pitkeathly, it will be seen that it contains ingredients which confer on it saline properties of a value equal to that claimed by many of the renowned British and Continental springs. In addition to this, it has a small quantity of iron in a form easy of assimilation by the system, so that where a ferruginous tonic is required these Waters will prove useful—the astringency consequent in the administration of iron being here avoided by the happy combination with the saline. In aërating the Waters by Messrs. Reid & Donald's process, it is made far more palatable, and its value enhanced by the fact that the carbonic acid has a stimulating effect on the digestive apparatus.

Further, from my knowledge of the careful and scientific principles on which the charging of the Water is conducted by the firm, every confidence may be placed in a good article being produced.

BURNLEY, 16th March, 1880.

NOTICE.—REID & DONALD, Chemists, Perth, have the sole and exclusive right to Aërate the Mineral Waters of Pitkeathly.

Sole London Agents—Messrs. W. BEST & SONS. **AGENTS WANTED ABROAD.**

Hunyadi János

CAUTION.—Circumstances which have come to the knowledge of Andreas Saxlehner, Buda Pest, Sole Proprietor of the Hunyadi János Spring, compel him to WARN the British Public against SPURIOUS IMITATIONS. To secure genuineness, purchasers should see that every bottle has on the LABEL the name of

"THE APOLLINARIS COMPANY (LIMITED), LONDON."

THE "BISSCHOP" PATENT GAS ENGINE.

VERY USEFUL
FOR
DRIVING
MINERAL WATER
MACHINES.

1,400
ENGINES
AT WORK
IN GREAT BRITAIN.

APPLY FOR TESTIMONIALS.

J. E. H. ANDREW & CO. STOCKPORT.

London Office:—123a, Queen Victoria Street, E.C.

BETTS & CO. LIMITED

(ESTABLISHED IN 1840),
SOLE MAKERS IN GREAT BRITAIN OF
METALLIC CAPSULES,
AND PATENTEES OF THE
Coloured Side Mark, Label, and other Speciality Capsules
(For the Prevention of Fraud and the Refilling of Old Labelled Bottles)
As supplied to Bass & Co., and the leading Brewers and Bottlers of Wines and Spirits throughout Europe.

PLAIN ORDINARY CAPSULES,
For Small Phials, **2s. 6d.** and upwards per 1,000, according to size, style, design, and quantity.
SPECIAL CONTRACTS FOR CONTINUOUS DEALING.

MANUFACTURERS OF
PURE ENGLISH MADE BOTTLING AND PACKAGE TINFOIL,
From **1s.** per lb., and upwards. **MIXED FOIL** (Foreign Quality), from **6d.** per lb. (according to gauge).
PATENT BARREL PACKAGES AND SNUFF CANISTERS, &c.

MANUFACTORIES:
LONDON:—Chief Office and Factories, Wharf Road, City Road, E.C.; and Holloway and Batavia Mills, Holloway, N.W.
BIRMINGHAM:—Moor Green Fields.
PARIS:—Office, 4, Rue Mogador, Chausse D'Antin.
BOURDEAUX:—Office, 3, Quai de Chartrons; Factory, Monrepos, Floirac.

PATENTEES OF
Hydraulic and Mechanical Pressure Capsuling Machines,
ESPECIALLY ADAPTED FOR CHEMISTS' COUNTERS.
Largely in use by the Trade, and efficiency guaranteed for all sizes of Bottles, at Royalties from **5s.** to **£2 2s.** per annum.

NATURAL BITTER WATER OF FRIEDRICHSHALL

INGRAM & ROYLE,

119, QUEEN VICTORIA ST., LONDON, E.C. & BATH BRIDGE, BRISTOL.

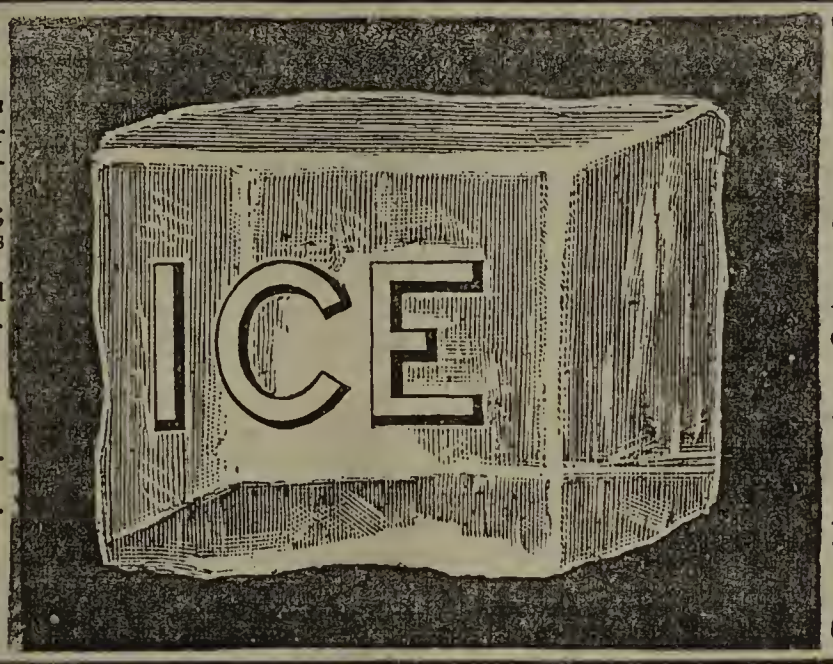
Price List and Pamphlet on "Natural Mineral Waters : their Properties and Uses," forwarded on application.

FOREIGN

MINERAL WATERS.

FREDERICKSHALL (5 Cases, 6d. per Case less), 28/6 Case, 30 bots.; 40/- Case, 60 ½-bots.
APOLLINARIS, 25/- Case, 50 bots.; 39/- Hpr., 100 ½-bots. Hampers free. 5 °/₀ discount if 20.
HUNYADI JÁNOS (10 Cases, 3/- and 5/- less), 30/- Case, 25 bots.; 50s. Case, 50 ½-bots.

SELTZER ..	11/-	Hpr.,	25 bots.
,, ..	15/-	Hpr.,	50 ½-bots.
PULLNA ..	18/-	Case,	20 bots.
,, ..	30/-	Case,	50 ½-bots.
VICHY ..	31/-	,,	50 bots.
,, ...	27/-	,,	50 ½-bots.
CARLSBAD ..	37/-	,,	50 bots.
KISSENGEN ..	42/6	,,	50 ,,
SCHWALLBACH	27/6	,,	50 ,,
HOMBURG ..	37/6	,,	50 ,,
WILDUNGEN	40/-	,,	50 ,,



CARLSBAD SALTS, ¼-bots., 20/- per doz.; ½-bots., 40/- per doz.; bots., 80/- per doz.

NORWAY

BLOCK ICE.

Original Blocks, 2s. per Cwt.
Packing and Mats free.
Low quotations given for quantities taken from vessels while discharging.
PRINTED DIRECTIONS for STORING ICE sent free on application.

W. B. HARRISON,

IMPORTER of ICE and MINERAL WATERS,
6, Bridge St. Sunderland.

BOURNE WATER

THE PUREST IN ENGLAND.

R. M. MILLS & CO.

BOURNE, LINCOLNSHIRE,
By appointment to H. R. H. the Duke of Connaught and the Royal Family,

Manufacture all kinds of Aërated Waters from this celebrated Artesian Spring.

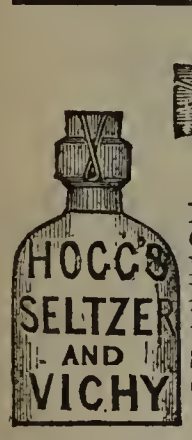
BOURNE SELTZER WATER

This Water with its natural Alkalinity combined with Artificial Salts produces one of the best

"SELTZER WATER OUT."

When taken at dinner time it promotes digestion. Early in the morning, slightly aperient.

Sold by their Agents throughout England. Price, with Descriptive Pamphlets, upon application.



LITHIA, with Potash or Ammonia.
CITRATE OF POTASH WATER.
POTASH AND SODA, B.P.
MINERAL ACID WATER.
PURE LEMONADE AND GINGER ALE.

Sole Makers of Stevenson's Aërated Lime Water.
The above may be had in Bottles or Syphons.

Orders for 6 dozen carriage free.
HOGG & SON, 1, Southwick Street, Hyde Park, W.

SODA WATER MACHINE

Second-hand, by MONDOLLOT, Paris, £15 ; Davenport American principle, £25 ; English Bramah principle, 400 doz. daily, £25 ; Engine and Boiler combined, £25 ; Corking Rack, Manchester style, £3 15s.; also others.

Write for particulars, or call. Catalogue and Estimates free post of N. G. WILCOCKS, Back Street, Bath.

BINGLEY'S

SUPERIOR

GINGER ALE

After numerous experiments the Proprietor is enabled to offer a beverage which is considered by many to be one of the *very best* of its kind.

It is manufactured especially for sale by Chemists doing a family trade.

COMPARISONS ARE INVITED.

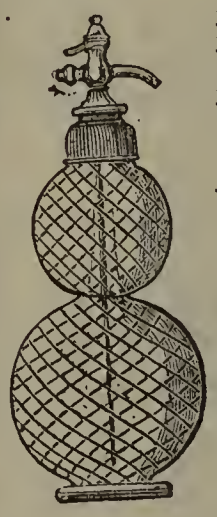
Samples may be obtained *gratis*, also trade terms, on application to

J. BINGLEY, NORTHAMPTON.

See Chemist and Druggist, January last, page 33.

EUGENE GERAUT & CO.'S

New Patent Lever Seltzogenes



Wholesale Prices as follows:—

3-pint, wire 13s. 0d.	5-pint, wire 18s.
3-pint, cane 13s. 6d.	5-pint, cane 19s.

8-pint, wire, 30s.; cane, 32s.
3-pint size, strongly silver-plated, richly decorated Porcelain stands .. .. each 30s.

5-pint ditto . 38s.	8-pint ditto . 48s.

IMPORTANT NOTICE!

For orders of three, 15 per cent. Large discount allowed off quantities upwards. Strongly silver-plated top, 5s. extra.

Powders for the above.

	12 Charges Per doz. Boxes.	10 Charges Per doz. Boxes.
3-pint size, in handsome labelled boxes	21s.	18s. 6d.
5-pint do. do.	30s.	26s. 0d.
8-pint do. do.	51s.	44s. 6d.

Liberal Discount.

WHOLESALE PRICES FOR SYPHONS.

Clear or coloured glass, viz., red, blue, green, or yellow, warranted pure ENGLISH BLOCK TIN TOPS, with piston or cap, 22s. 6d. *per dozen or* £13 10s. *for quantities of not less than one gross.* PACKING IN CASK 5s. PER GROSS.

The Name marked on the metals free of charge for quantities of not less than one gross. The Name engraved on the glass with Trade Mark, 1s. 6d. and 2s. per dozen extra.

1 & 2, Corporation Bldgs., Farringdon Rd., London, E.C.

APOLLINARIS, SELTZER, ST. GALMIER

AND ALL OTHER NATURAL TABLE WATERS,

CARLSBAD, FRIEDRICHSHALL, HUNYADI-JANOS, PULLNA, VALS, VICHY, &c. &c.

INGRAM & ROYLE

119, QUEEN VICTORIA STREET, LONDON, E.C. and BATH BRIDGE, BRISTOL

Price List and Pamphlet on "NATURAL MINERAL WATERS: their Properties and Uses," on application.

NORTH WALES MINERAL WATERS FACTORY, WREXHAM.

"Honourable Mention" at the Paris Exhibition, Certificate of Merit awarded by the Council of the Sanitary Institute of Great Britain, for these Waters, also at International Exhibition, London, 1881.

J. F. EDISBURY & CO.

Having purchased the extensive Plant and Machinery from the Zoedone Co. (late R. Evans & Co.), are now Manufacturing First-class AERATED and MINERAL WATERS, SODA, POTASS, LITHIA, SELTZER, LEMONADE, GINGER ALE, THE "EXCELSIOR" TABLE WATER CARBONINE (retailed at 2s. 6d. per doz.), CHAMPAGNE LIME JUICE (equal to Moselle).
Sent out in Bin Cases; carriage paid on one gross. All under the personal supervision of Mr. J. F. EDISBURY, M.P.S.

Price Lists, Counter Bills, &c., free on application.

Edisbury & Co.'s Champagne Lime Juice is a grateful, refreshing, and valuable drink, and cannot fail to command a wide popularity.—NORMAN KERR, M.D., F.L.S., London. 1st October, 1881.

Edisbury & Co.'s Champagne Lime Juice is one of the purest and best beverages before the public. The merits of your manufactures are indubitable.—H. SAVILLE CLARKE, Westbourne Park.

MAY-DAVIS'S

PATENTED

IMPROVED METHOD OF BOTTLING AËRATED WATERS, BEERS, WINES, &c.

With this Machine Soda Water of the highest quality is produced with a pressure of from 65 to 80 lbs. in the cylinder, instead of 120 to 200 lbs. as hitherto, and all other Aërated Waters and Beverages at a proportionate reduction of pressure. Skilled labour is dispensed with and great saving effected.

THE PRICE OF THE MACHINE IS £35.

It may be seen at Messrs. HAYWARD TYLER & CO.'S, Upper Whitecross Street, E.C., or in operation at the Patentees' premises, Esher Street, Page Street, Westminster, S.W.

FISHER'S SOLUBLE ESSENCE OF JAMAICA GINGER

Perfectly free from any Foreign ingredient.

The Proprietor invites the attention of Pharmacists and Manufacturers of Ærated Waters to the above preparation, which contains more of the Aromatic and Pungent principles of Jamaica Ginger than any other Soluble Essence yet introduced to the Public.

Price 4s. 6d. per Pound.

Special quotations to large consumers To enable comparison with other preparations—which is respectfully requested—a sample bottle of 8 ounces will be sent, Carriage Paid, to any address in the United Kingdom, on receipt of Postal Order for 2s. 6d., b the maker,

F. D. FISHER, Pharmaceutical Chemist, Grantham.

PURE SOLUBLE *ESSENCE of GINGER*

Guaranteed to be of the fullest possible strength, and perfectly free from any foreign ingredient.

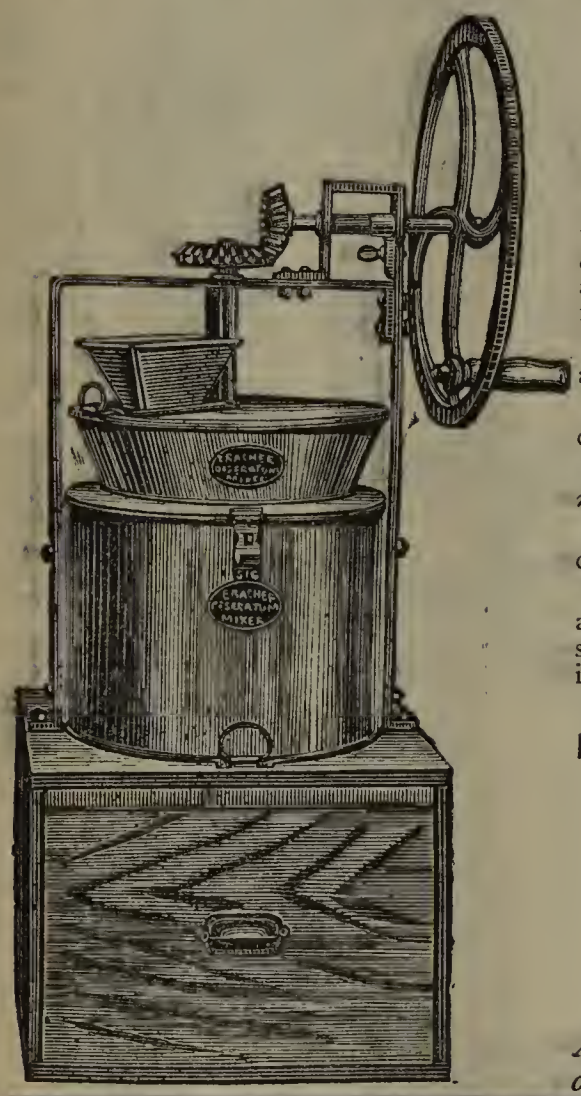
Price 4/- per lb.

SPECIAL QUOTATIONS FOR CASH.

Manufacturers of Ærated Waters, &c., should not fail to note the price of this preparation as compared with other makers. Address orders,

J. WISE, Dispensing Chemist,
ST. NEOTS.

BRACHER'S PATENT
"DESIDERATUM" MIXING MACHINES.



Manufactory, 77, HIGH STREET, WINCANTON.

Whilst introducing our *revised* Catalogue we would invite *special attention* to an *entirely new feature* in connection with all our Mixers having an outlet at the bottom, viz.: the addition of a bench with a drawer of sufficient capacity to contain the whole of the ingredients which have been mixed, thus preventing the annoyance arising through discharging the powders into an open vessel. All Machines with crank or handle at the side are now fitted with *brass bearings*. We can therefore confidently recommend the above as the *most rapid, efficient* and *labour-saving* Mixing Machines which have ever been invented, and would urge all who do not possess them to purchase without delay. Among the many advantages claimed for these Machines we may mention the following, viz:

FIRSTLY—The ingredients may be placed in the sieve separately with quite as good an effect as if they were previously thrown together.

SECONDLY—The mixing, sifting, and crushing being simultaneously performed, the contents can be discharged very soon after passing through the sieve.

THIRDLY—By the action of the Crusher on the Sieve, the powders are reduced more *rapidly* and *thoroughly* by a *coarse* mesh than was formerly done by a *fine* one.

FOURTHLY—The sieves may be *entirely dispensed with* if none of the powders contain concrete lumps.

FIFTHLY—They can be worked either *with* or *without* the cover, are easily cleaned, and are without doubt the best and cheapest Mixing Machines ever invented, indeed it would scarcely be thought possible that the articles could be so thoroughly blended in such an incredibly short time.

N.B.—Machines neatly repaired, and recent improvements added at very moderate charges.

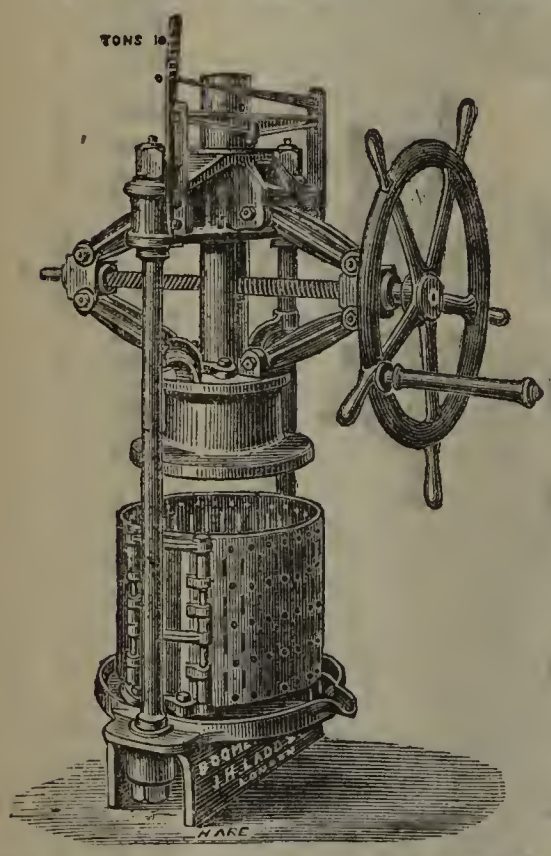
Wincanton, 10mo., 16th, 1882.

All former lists and terms are hereby cancelled. Subject to alteration without notice.

TERMS:—CASH, LESS 2½ PER CENT. DISCOUNT.

☞ *To prevent mistakes when ordering, please quote reference letter of Alphabet, and Price. All sizes are kept in stock, but sieves are manufactured only on receipt of order.*

THE "BOOMER" PRESS



UPWARDS OF

50 GOLD & SILVER MEDALS

Have been awarded to

THE "BOOMER" PRESS

Over 9,000 Sold

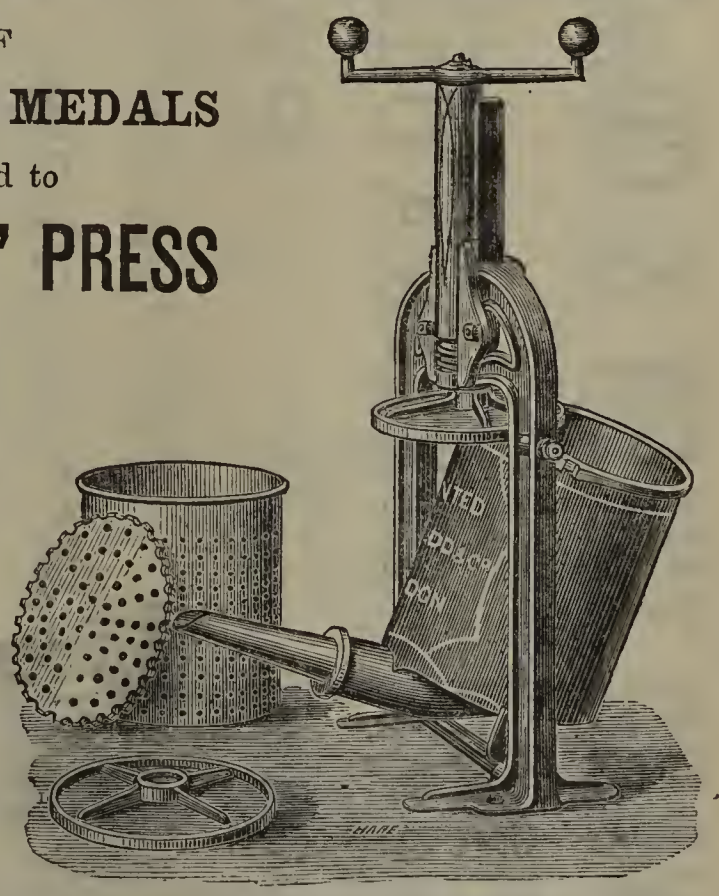
Equal to Hydraulic Power, without the possibility of yielding.

No Made Foundation required.

No liability of getting out of order.

Can be worked by hand or power.

Made to any required size, and up to a pressure of 600 tons. Cylinder and plates tinned if required.



FOR FULL PARTICULARS APPLY TO

J. H. LADD & Co. 116, Queen Victoria St. E.C.

SMALL PATENT TINCTURE PRESS.

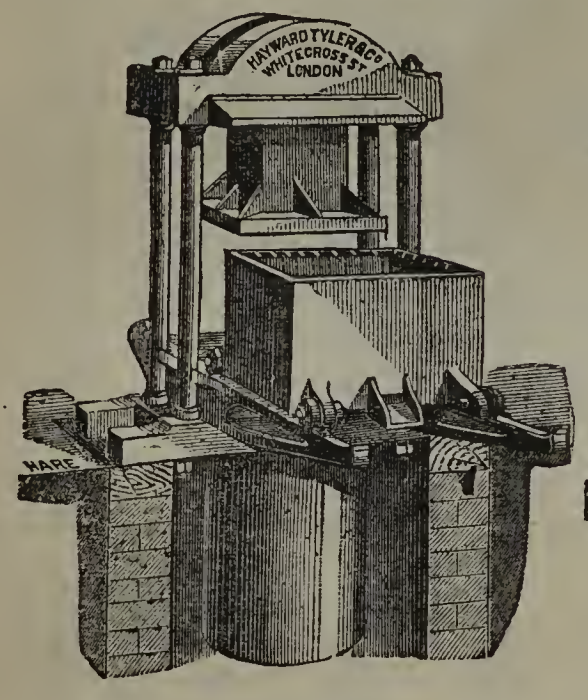
Sizes, 2 Quarts and 4 Quarts.

Prices, 24s. to 30s.

This Illustration shows the Cylinder tipped back ready for filling. The *inside of the Cylinder is enamelled, and will not be affected by acids.* May be used with or without perforated extra cylinder.

HAYWARD TYLER & CO. WHITECROSS STREET, LONDON

MAKERS OF

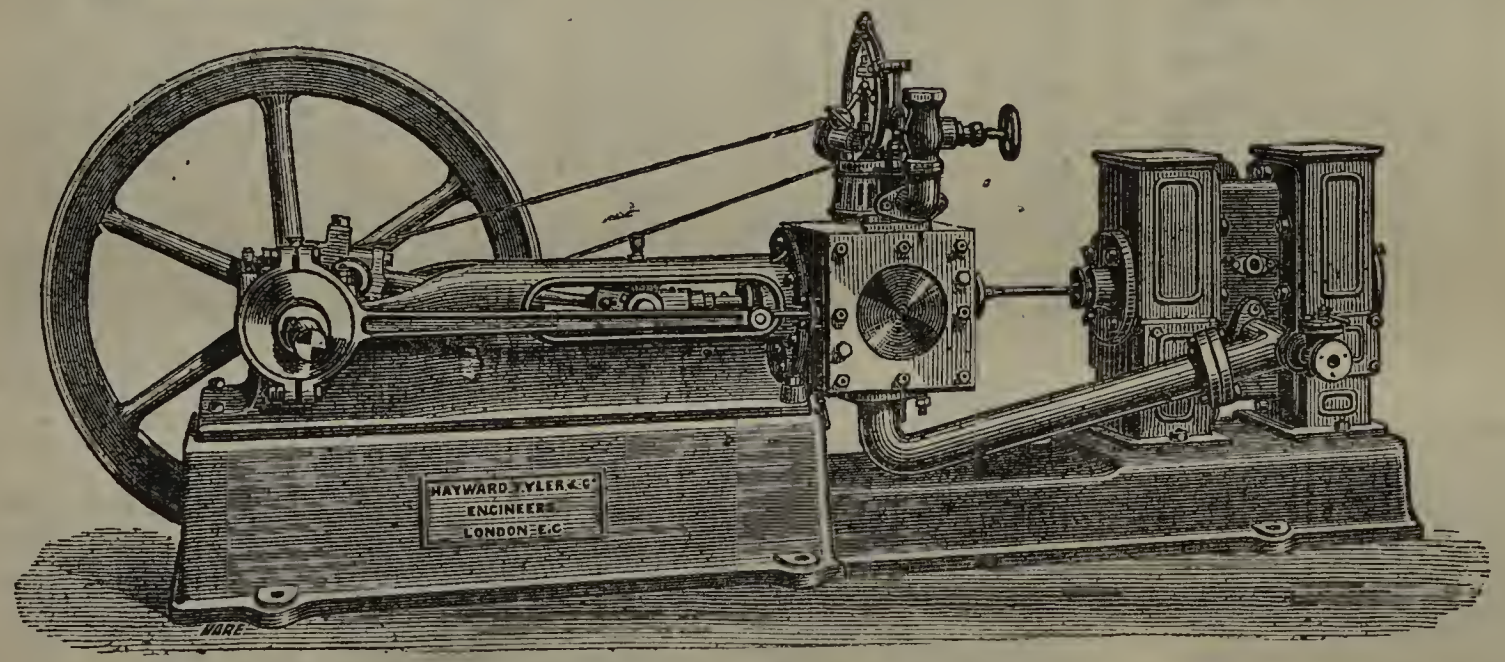


HYDRAULIC PRESSES

Especially adapted for the use of

MANUFACTURING CHEMISTS,

For EXPRESSING TINCTURES, &c.



HIGH AND LOW PRESSURE STEAM ENGINES

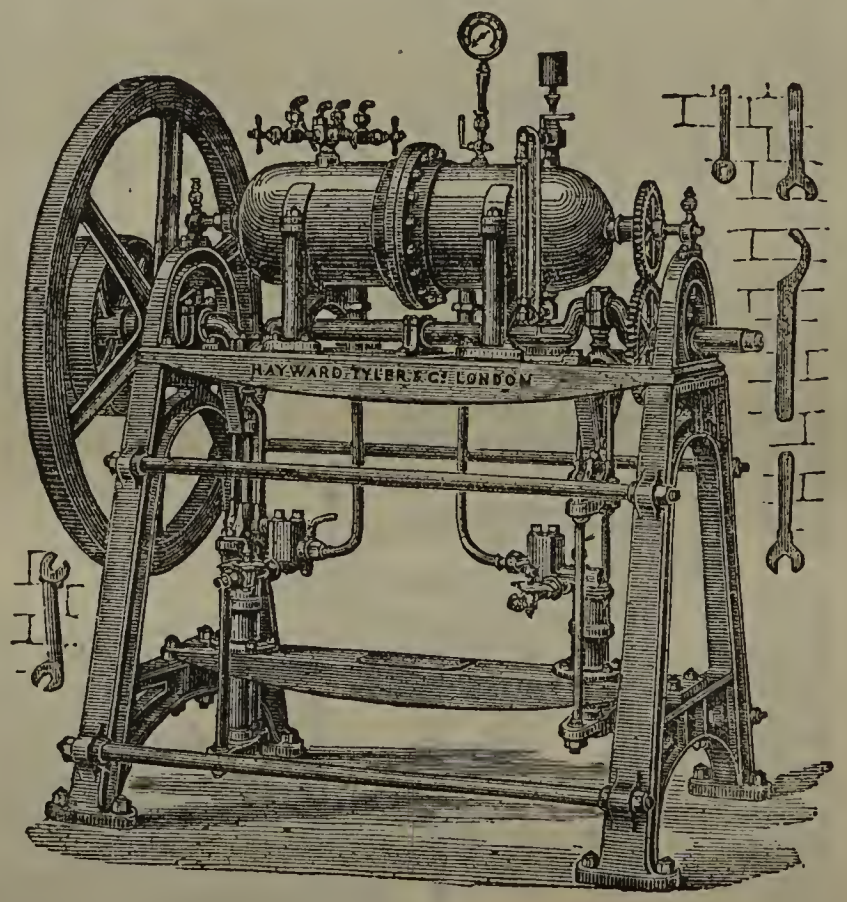
As a *Specialité* Messrs. H. T. & Co. make these Engines capable of working with Steam at as Low a Pressure as 2 lbs. per square inch very effectively.

SODA WATER MACHINERY

GOLD MEDAL, PARIS, 1878.

HIGHEST AWARD, MELBOURNE, 1881.

THE "TROPICAL" MACHINE.



EQUAL TO AËRATING

3,000 DOZEN of WATERS PER DAY.

SODA WATER MACHINERY

BY

BARNETT & FOSTER, 22n, Forston St., Shepherdess Walk, London, N.

Prize Medals—London, 1862, 1873, 1874; Paris, 1867, 1878; Vienna, Philadelphia, Cape, &c. Highest Award, Sydney, 1879–80.

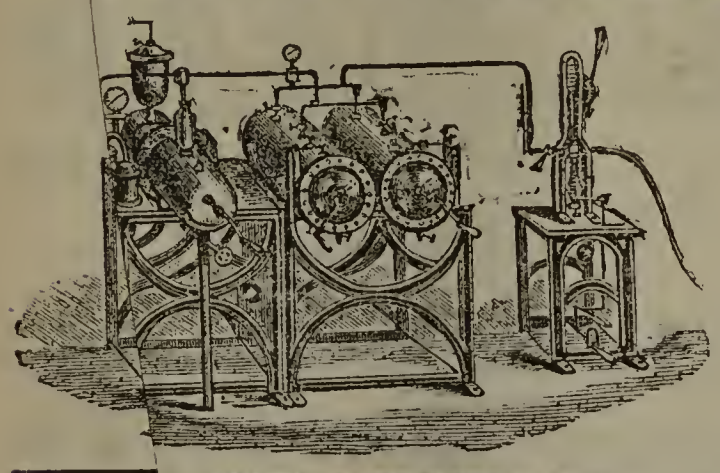
Our Machines are universally adopted throughout the world for the manufacture of all kinds of Aërated Drinks, whether in bottles, syphons, or counter fountains. There are in England alone over 1,500 factories where our Machinery is in use. They are the simplest, safest, and cheapest for the purpose, and produce a highly-charged gaseous water free from metallic or foreign contamination.

All our Machines have a Gasometer, and it forms a most important necessity where purity of product is required, as in this the gas is expnded and purified; it also removes the possibility of accidents by explosion, and avoids the necessity of complication—these we consider of greater importance than the saving of a few inches of floor space. *Our valuable Book of Recipes and Instructions accompanies every Machine, and the most unskilled can at once produce Waters of the highest class.*

Sole Agents for Codd's Patent Bottle, Fig. 1. Sole Manufacturers of the "London-Made" Syphon, Fig. 2.

PATENTEES OF THE IMPROVED CORKING MACHINE FOR CHAMPAGNE BOTTLES. ILLUSTRATED CATALOGUE FORWARDED FREE.

SODA WATER MACHINERY,



Patent Stoppered Bottles,

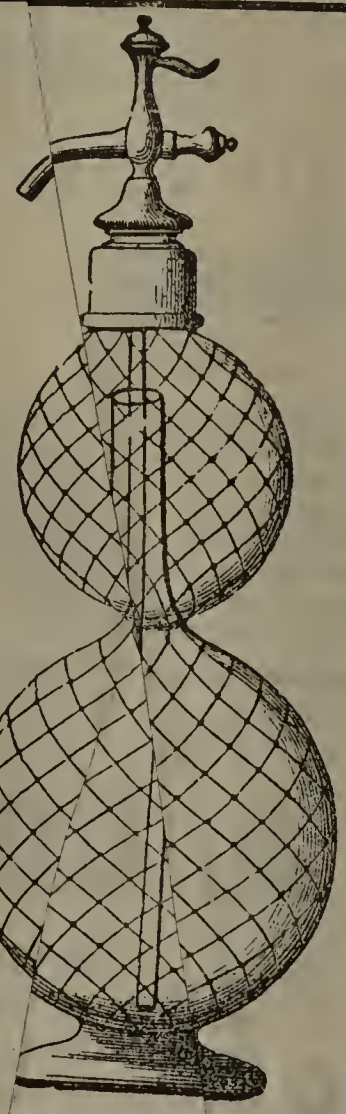
AND ALL APPLIANCES.

Before purchasing send for Catalogues to

DAVENPORT & CO.

99P, High Holborn, London.

FIRST ORDER of MERIT awarded to THESSIER-FÈVRE. MELBOURNE EXHIBITION.



Trade Mark Registered.

CELEBRATED

D. Fèvre Seltzogènes and Powders

For immediate production of Soda Water, Eau de Vichy, Sparkling Lemonade, and Aërated Wines.

D. FÈVRE, 398, RUE ST. HONORÉ

PARIS,

Sole Inventor and Proprietor of the Article and Name "SELTZOGÈNE,"

THESSIER-FÈVRE, Son-in-Law, Manufacturer.

WHOLESALE PRICES.

Celebrated D. Fèvre Seltzogene.	3 pint, wire covered ...	12*s.* 0*d.*	each.
	3 pint, cane covered ..	12*s.* 6*d.*	,,
	5 pint, wire covered .	18*s.* 0*d.*	,,
	5 pint, cane covered ..	19*s.* 0*d.*	,,
	8 pint, wire covered ..	30*s.* 0*d.*	,,

Liberal discount allowed.

Case & Packing ...	12	Seltzogènes,	3	pint size,	4*s.* 0*d.* net.
,, ,, ..	12	,,	5	,,	5*s.* 8*d.* ,,
,, ,, ..	6	,,	8	,,	9*s.* 8*d.* ,,

Celebrated D Fèvre Powders for the Seltzogènes	3 pint, per doz. boxes of 12 charges,		24*s.* 0*d.*
	5 ,, ,, ,,		36*s.* 0*d.*
	8 ,, ,, ,,		60*s.* 0*d.*
Pure Tartaric Acid & Bicarbonate of Soda in the highest state of perfection.	3 pint, per doz. boxes of 10 charges,		20*s.* 6*d.*
	5 ,, ,, ,,		30*s.* 6*d.*
	8 ,, ,, ,,		45*s.* 2*d.*

Liberal discount allowed.

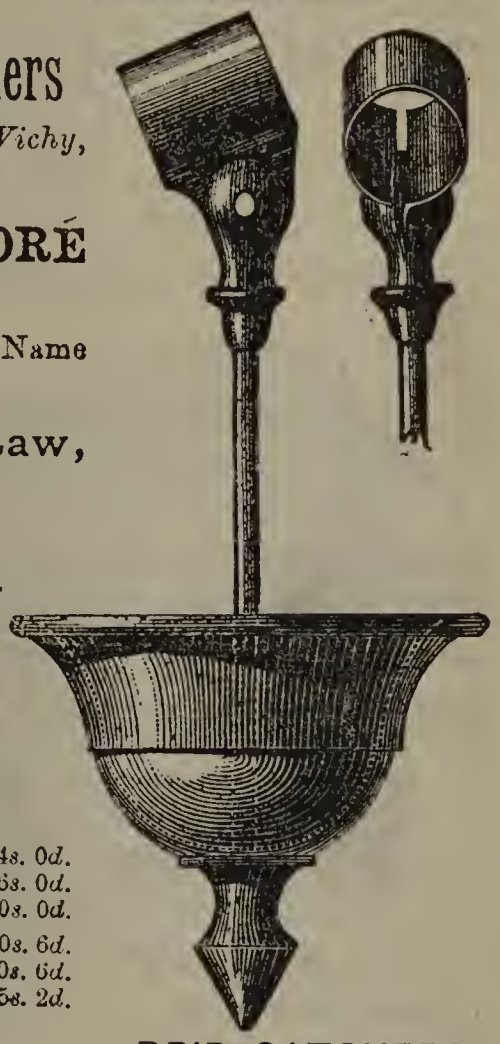
EXTRA:—Taps, Tubes, Valves, Washers, &c.

Direction for Repairs.

DRIP CATCHERS, FITTINGS, MEASURES, &c.

ALL MY GOODS ARE TESTED.

ILLUSTRATED CATALOGUE FORWARDED FREE.



DRIP CATCHERS

for

D. FÈVRE SELTZOGÈNES.

8*s.* 6*d.* per dozen.

Registered April 1, 1879.
No. 333,951.

THESSIER-FÈVRE,

Sole Manufacturer.

GEORGE TREBLE & SON,

SHOP FITTERS AND SHOW CASE MAKERS.

PLANS AND ESTIMATES SUPPLIED.

BRIDGE WHARF, WHITMORE ROAD,

HOXTON, LONDON, N.

Agents—S. MAW, SON & THOMPSON, 7 to 12, Aldersgate Street, CITY.

GREAT SAVING OF MONEY AND LABOUR.

SOMETHING NEW

ELEGANCE AND DURABILITY COMBIND.

PATENT RECESS LABELLED SHOP ROUNDS. Parties about to Open New Establishments or Refit Old Prmises, should compare following Net Prices. *These Prices include Glass Labels attached to Bottles ready for use.*

Size.	Height.	Flint Glass. N.M.	Flint Glass. W.M.	Blue Glass. N.M.	Blue Glass. W.M.
16 ounce	8 inches	16/6	18/6	20/	22/ per dozen.
20 ,,	9 ,,	17/6	20/	21/	23/ ,,
32 ounce	10½ inches	20/	22/	22/	26/6 per dozen.
42 ,,	11 ,,	22/	25/6	26/6	30/ ,,

Prices of other Shop Bottles &c., on application. *Sample Bottle sent on receipt of* 1s. 7d. *in stamps.* *Fac-Simile* sheet Labels, in various styles, sent on receipt of two stamps. *Amongst others, the following parties have recently been supplied with these Bottles*—

Ady, Dr. J. C., Rangoon
Beckwith, H. B., Grenada
Blair, John, Cork
Brevis, John, West Hartlepool
Brumwell, H., Sutton, St. Helens
Brunton, W. W., South Kensington, London
Carruthers & Allan, Dumfries
Catford, O. W., Crewkerne, Somerset
Cullen & Co., South Norwood, London
Cummings Bros., Dundee
Day, J., Savile Town, Dewsbury
Gardner, A. W., Auckland, N.Z.
Gibbs, R. D., Smethwick
Keith, John, Kirkgate, Leeds
Kinninmont, A., Glasgow
Lodge, G. H., Rotherham.
Macfarlane, A. Y., Edinburgh
Mason, W. D., Grimsby
Maston, G., Hartlepool
McCaul, J. & G., Londonderry
McRae ,Alexander, Edinburgh
Morris, J. L., Moss Side, Manchester
Noble, A., Galashiels
Parsonson, T., Jersey
Pattison, H., Coleham, Shrewsbu
Quiray, W. D., Belfast
Rand, E., Wagga-Wagga, New Soth Wales
Senior, Harold, Norwood Lane, London, S.E.
Sibthorpe, S., Wolverhampton
Smith, Albert, Ilfracombe
Taylor, W. G., Hungerford
Walton, M. F., Sowerby Bridge
Waterhouse, A., Dewsbury
Wills & Wootton, Westminster College
Wing, Lewis, Chislehurst
Woodcock, A., Coltishall, Norwich

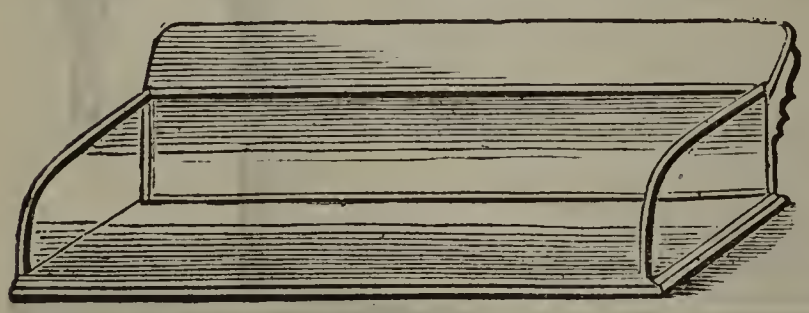
Sole Agents: GLASGOW APOTHECARIES' COMPY, Virginia St., Glasgow.

E. NATALI, Shop Fitter and Show Case Maker,

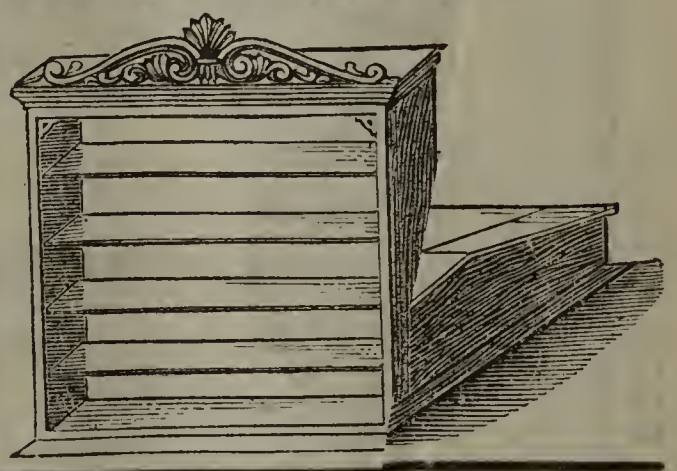
207, OLD STREET, SHOREDITCH

ALMOST OPPOSITE GREAT EASTERN STREET.

ESTIMATES AND DESIGNS FREE.



A large Stock of New and Second-hand Fittings always on hand.



66, PENTONVILLE ROAD, LONDON, N.

W. J. LEMAITRE & CO.

ESTABLISHED 1830.

Manufacturers of

COUNTER SHOW CASES,
BRASS WINDOW FITTINGS,
POLISHED-EDGED GLASS SHELVES,
COUNTERS, DRAWERS, DESKS, &c.

MEDICAL & GENERAL

SHOP FITTERS

WRITERS, DECORATORS, &c.

Estimates Free.

SHOW JARS AND COVERS,
MEDICAL LABELLING,
WOOD AND GLASS LETTERS,
FACIAS AND WINDBLINDS,
BOTTLES, CARBOY &c.

66, PENTONVILLE ROAD, LONDON N.

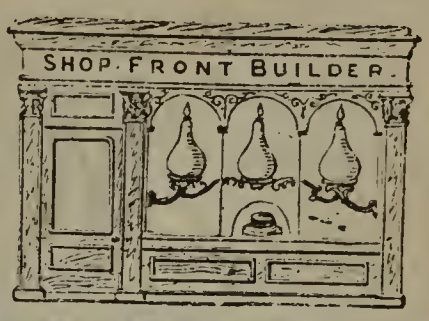
SHOP-FITTINGS.

ESTABLISHED 1830.

SAMUEL HOWLETT,

4, LINDLEY STREET (formerly called North Street), SIDNEY STREET, MILE END, LONDON, E.

A few minutes' Ride by Omnibus from the Bank.



MEDICAL AND GENERAL SHOP-FITTER.

Shops fitted by S. H., and to whom references are kindly permitted:—

Messrs. Corbyn, Stacey, & Co., 7, Poultry, E.C.
Mr. H. Deane, Clapham, London.
„ John Broad, Rise House, Hornsey Rise, N.
Etc. Etc. Etc.

Mr. N. Nicholson, Canonbury, London.
Messrs. Leath & Ross, St. Paul's Church Yd., London.
Etc. Etc. Etc.

Messrs. Harvey & Reynolds, Leeds.
Mr. W. F. Smith, 280, Walworth Road, S.E.
„ Thomas Hall, Lowestoft.
Etc. Etc. Etc.

Cabinet Fitter to the Pharmaceutical Society of Great Britain. Manufacturer of every description of Air-tight Glass Show-Cases for Chemists, Jewellers, etc. Medical Labelling, etc. Plans and Estimates for Entire Fittings and Alterations supplied.

W. HAWKE & SON,

SHOP FITTERS AND SHOP-FRONT BUILDERS

WILD COURT, GREAT WILD STREET, DRURY LANE, LONDON, W.C.

Medical Glass, Earthenware, Utensils, &c.

CLOSED AT 5 P.M.; SATURDAYS, 12 A.M.

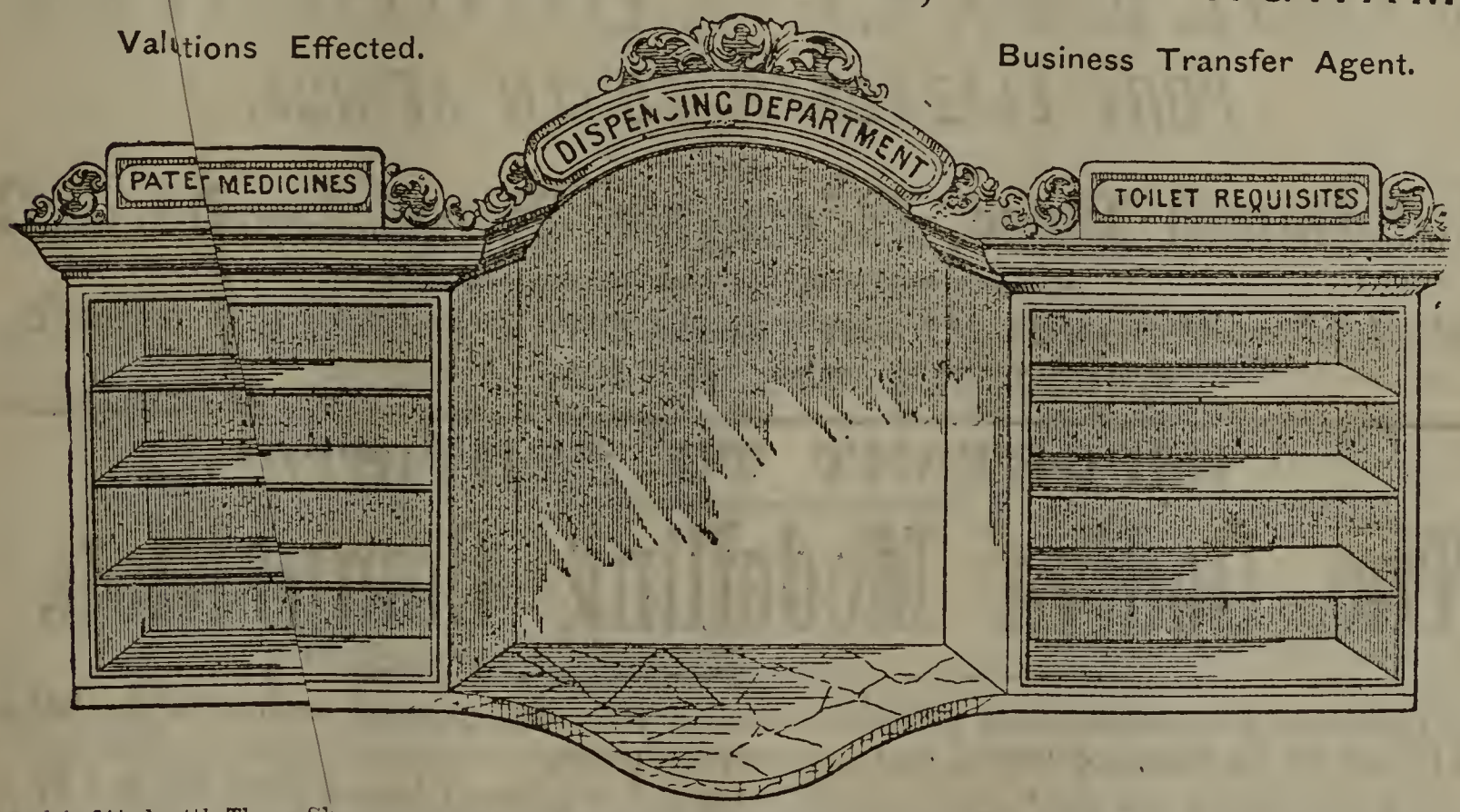
R. TOMLINSON,

DRUGGISTS' SHOP-FITTER, SHOW-CASE MAKER,

And Manufacturer of Druggists' Sundries,

15, ST. PAUL'S SQUARE, BIRMINGHAM.

Valuations Effected. Business Transfer Agent.



This Case is made of choice Mahogany, with Mirror in centre, and is lined at back with Black Enamelled Leather cloth; it has Plate-Glass Shelves, Glass Knobs on the Doors, Marble Slab in the Centre, and is fitted with Three Shelves at back. The Case is 6 feet long, 29 inches to cornice, 33 inches to top of tablets, and 36 inches to top of centre mirror.

For Export or easy transit it is admirably adapted, as it takes to pieces, and can be fixed again in an hour. Packs into a Case 34 by 36, at a cost of 10*s*., 3*s*. of which is allowed if the empty is kept, and the full value allowed if returned carriage paid. **Price £8 10s.**

Second-Hand Fixtures for Sale, Jars, Globes, Drawers, Bottles, Counter Glass Cases, Shelves, &c.

SECOND-HAND FIXTURES OF ALL KINDS BOUGHT AND EXCHANGED.

R. T. will wait upon parties living up, to plan and advise. 2nd-class fare only charged. For Sale, Fixtures for Shop about Sixteen feet by Twelve. Write for List.

SPECIAL NOTICE.

MUMFORD'S

PURE

CRUSHED LINSEED

IS NOW REDUCED TO

PER **19/-** CWT.

(In smaller quantity, 20/- cwt.)

"NOTHING FINER CAN BE OBTAINED."

NO OIL EXTRACTED.

STEAM MILLS, FARRINGDON ROAD E.C.

B. G. LENNON & CO.

WHOLESALE DRUGGISTS,

PORT ELIZABETH, SOUTH AFRICA,

AND

11, Edmund Place, Aldersgate Street, London, E.C.

THE LONDON HOUSE UNDERTAKES THE PURCHASE OF DRUGS, CHEMICALS, ETC. ON COMMISSION.

IMPORTANT TO DENTISTS

The Godiva Modelling Composition.

The above Preparation, since its introduction in 1870, has acquired world-wide reputation, and is used by the Principal Dental Practitioners everywhere.

For Particulars, see the "Special Announcement," interleaved between pages 66 and 67 of the *British Journal of Dental Science*, issued on January 15th, present year. Or write for same to the

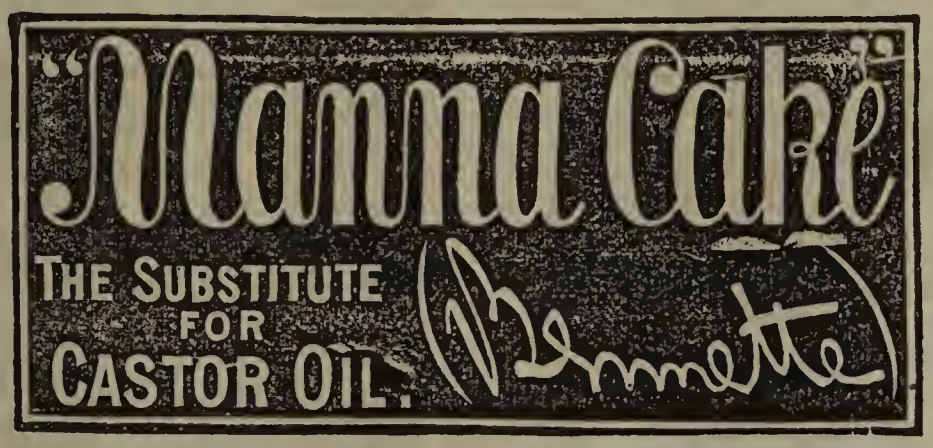
MANUFACTURER,

JAMES HINDS, DENTIST, COVENTRY.

SOLE AGENCY OFFERED

TO NON-CUTTING BRITISH, COLONIAL, AND FOREIGN CHEMISTS.

REGISTERED TRADE MARK, No. 22,133.



Wholesale 12/ per gross.

Less 12½ per cent. at 1 month.
,, 5 per cent. at 3 months.
,, 15 per cent. off cash with order.

Retail 1½d. each (18/ per gross).

SUPPLIED TO ONE RETAIL CHEMIST ONLY IN EACH TOWN, DISTRICT, OR COUNTY (through whom alone Chemists can order), who must engage in writing to supply none but Chemists, and to charge cutting Chemists a price at which they cannot cut.

The **MANNA CAKE** is done up only in quarter-gross cases, for home trade; foreign, in bulk.

With each case (the smallest quantity supplied to Chemists) is enclosed a most effective Window Slip (20 in. by 8 in.).

CONDITIONS OF AGENCY

(GREAT BRITAIN AND IRELAND).

1.—Perpetual Sole Agency guaranteed. *No Wholesale House is, or will be, supplied.*

2.—1,000 Handbills, containing Trade Mark, are sent with each gross ordered, and 2s. per gross deducted from account, which Agent must expend in best local newspapers.

3.—Agent to take at his own risk quantities as here given, viz.:—In Great Britain—one gross for every 4,000 population; in Ireland—one gross for every 6,000 population, of the town or district for which he accepts.

4.—Terms Cash, or TWO REPUTED Referees.

N.B.—In the case of acceptances for large districts and counties, the whole quantity contracted for is sent in consignments at stated intervals subsequently agreed on. The discount allowed is 20 per cent. off cash against the several consignments, and beyond this 2/- per gross is deducted, which sum the Agent must engage to enter in the best newspaper media. Casts of Trade Mark sent when required for newspapers. Agents charge to chemists, 12/6 to 13/- per gross, net.

From January 15 last to February 20, nearly 190,000 Manna Cakes were contracted for, making a total from the beginning of nearly 400,000.

TO COLONIAL AND FOREIGN HOUSES

Monopolies are offered on terms enabling them to force the sale in any way they think best. Terms 6/- per gross, free alongside ship, less 2½ per cent. for cash against shipping documents. No printed matter is included in this, the consignee issuing such matter as he thinks best for his monopoly, the large margin of 12/- per gross being allowed for this and retail profits. These contracts are made on the basis of one gross for every 8,000 population, and the interests of consignor and consignees will be enhanced by the contracts covering as large districts as can conveniently be managed. In these cases the whole quantity contracted for should be taken out within three years, and consignees must guarantee in writing not to supply the home trade through any source.

Applicants for these must state the boundaries of monopoly sought, and its population, which will be compared with printed statistics. Should these boundaries infringe on existing monopolies, the fact will be pointed out, and arrangements made accordingly.

For samples, propaganda, &c., write—W. RYDING-BENNETT, Chief Depot, 268, Walton Road, Liverpool.

EXTRACTS FROM AGENTS' LETTERS.

"Please forward another 4 gross. Its pleasant taste and easy operation constitute it a favourite medicine in my own, as in other families."

A. T. BORTHWICK, Chemist, Selkirk.

"Send another 4 gross. I am doing a good trade in it, having, in fact, got through nearly 8 gross since September last."

RICHARD MARCH, Chemist, Leicester.

"Your offer of Agency to hand, which I accept on conditions named, as your arrangements appear thoroughly straightforward, and for that reason command my attention.

"I am particularly pleased to note you supply Chemists only, and them *direct*. It is an article which must command a good sale." G. K. GOSSOP, Chemist, Grimsby.

"A Physician in the West of England says he gave Calomel and Jalap in repeated doses without effect, but a MANNA CAKE acted almost immediately.

"The above is a *bona fide* statement, but I am not authorised to give name and address.

"The article is selling freely."

W. H. HAYWARD, Chemist, Trowbridge, Wilts.

"This move of yours is in the right direction. The sooner Chemists bestir themselves to foil the 'cutting' system, the better for them and for Proprietors."

JOHN BIRKETT, Chemist, Morecambe.

"It is one of our best preparations."

HENRY BECK, Chemist, Albrighton, Salop.

"It is singularly mild and efficacious. I certainly consider it a splendid substitute for Castor Oil."

A. CHRISTIE, Chemist, Newton-Abbot, Devon.

"The sale in towns is sure to be enormous."

LEWIS WING, Pharmaceutical Chemist, Chislehurst.

"They are much liked, and sell well."

W. GRAHAM CARR & SON, Berwick.

"I can do with 8 gross." T. HAY-HENRY, Chemist, Banff.

"Send 16 gross with necessary bills."

R. SOWERBY, Middlesborough.

"Send another 4 gross. My counter sale last week was over 10 dozen." [Fourth order.]

JOHN LEA, Chemist, Folkestone.

"It answers the purpose admirably and gives great satisfaction. It (or you) may justly be called 'The Children's Friend.'"

H. T. DOBLE, Chemist, Tavistock.

"The Manna Cake is selling well, and gives great satisfaction. It is an excellent preparation."

S. STEPHENS, Chemist, Huddersfield.

[Mr. Stephens has contracted for 150 gross]

N.B.—If at any time an Agent can prove that the conditions hereinnamed have been violated, he is entitled to return any goods on hand, and to demand payment for them.

WHAT IS IT?

ASTHMA

and other MALADIES of the RESPIRATORY ORGANS.

SLADE'S

Anti-Asthmatic Cigarettes,

after many careful trials, and found to be safe, efficient, and agreeable, are now prescribed at the Brompton and Victoria Park Hospitals, and by many eminent Physicians. Delivered in sealed bottles at 2/9, 4/6, and 11/- Sample free on application. A liberal Discount to Pharmacians.

THOS. SLADE, Pharmacian, 118, Long Acre, London, and all the Wholesale Houses.

"THE POSITIVE CURE" "PERTUSSIS"

WHOOPING COUGH

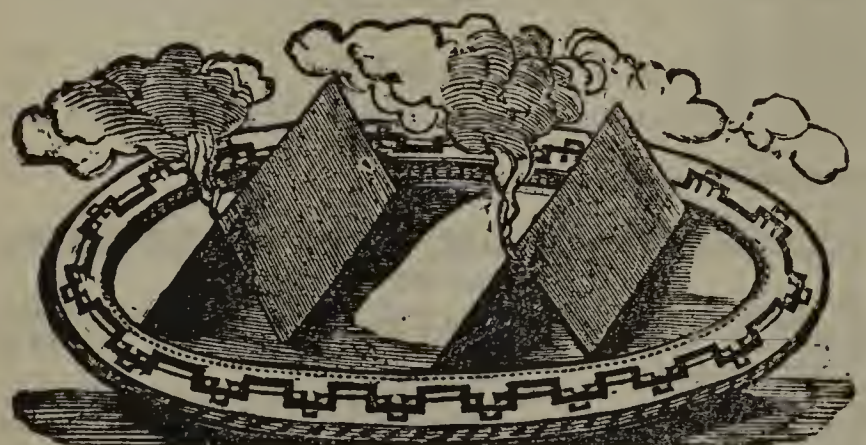
POST FREE 9d. AND 1/1½ FROM A.J.HEALD.M.P.S. BURNHAM, BUCKS

This preparation is recommended to the trade with confidence as a CERTAIN cure for Whooping Cough. Any chemist who knows of a severe case in his neighbourhood will be conferring a favour on the proprietor if he will write for a *gratis* sample packet of "**PERTUSSIS**," merely enclosing 1*d.* stamp for postage, and give it a fair trial. This cannot fail to lead to a demand for the remedy, which only requires an introduction into a neighbourhood where Whooping Cough is prevalent to command a large sale. Address, **A. J. HEALD, M.P.S., Burnham, BUCKS.**

OZONE PAPER,

FOR THE IMMEDIATE RELIEF AND SUBSEQUENT CURE OF

ASTHMA, BRONCHITIS, AND BRONCHITIC ASTHMA.



DIRECTIONS.—Fold and place one or two pieces of paper on a dish and light the top at point A. A dense fume will then arise and gradually fill the room; and after inhaling it for a few minutes the air-tubes will be cleared of mucus, difficult respiration will cease, and the patient will fall into a sound and refreshing sleep. The outer air must be excluded by keeping the windows, doors, and chimney closed. The paper may be burnt in the day as well as at night if necessary.—Price 2*s.* 9*d.*, 4*s.* 6*d.*, and 11*s.* per box.

OZONE CIGARETTES.

DIRECTIONS FOR USE.—A Cigarette may be lighted at either end, and a large volume of smoke should be drawn into the mouth, then a full inspiration taken to convey it into the air-tubes, when instant relief will be afforded.—Price 2*s.* 6*d.* per box.

This remedy is advertised in the *Lancet* and *British Medical Journal*; it is therefore known to members of the Medical Profession, by whom it is recommended.

PREPARED BY R. HUGGINS, CHEMIST, 199, STRAND, LONDON.

NO MORE HEAD-ACHES.

A perfect boon to the studious and over-worked.

PRIOR'S

PO-HO-YO

A Sure Remedy for Nervous Head-Ache, and all Neuralgic Ailments.

PREPARED ONLY BY

GEORGE T. PRIOR,

Pharmacist, 32, Broad Street, OXFORD.

Prices:—1*s.* 1½*d.* and 2*s.* 9*d.* each; or, by post, 1*s.* 3*d.* and 2*s.* 10*d.*

Printed matter with address.

Names of Agents advertised.

FRAMED SHOW-CARDS SUPPLIED.

(Photograph of Steamer in a Storm—very effective.)

KERMODE'S Reg.

Nausine

The Cure for

Sea-Sickness

of all CHEMISTS

PRICE 2/-

ILLUSTRATED HAND-BILLS SUPPLIED.

WHOLESALE AGENTS.—Messrs. MAW, SON & THOMPSON, London; Messrs. EVANS, LESCHER & WEBB, 60, Bartholomew Close, London: Messrs. EVANS, SONS & Co., 56, Hanover Street, Liverpool. Sole Proprietor,

R. K. KERMODE, Dispen. Chemist, Castletown, Isle of Man.

FOR TOOTHACHE AND NEURALGIA!

STEVENSON'S

TOOTHACHE PILLS

Afford an efficacious and safe remedy.

Forty years' experience has established their reputation.

In order to prevent these pills being sold at 9d. or 9½d. while they are advertised at 1/1½, the Proprietor has been compelled to advance the Wholesale Price, which in future will be 10/6 per dozen net for small parcels.

Retail Agents requiring Handbills, with Name and Address, can be supplied at any time by applying to

R. W. STEVENSON, Chemist,

19, VICTORIA STREET, DERBY.

WATSON'S
COMPOUND CASTOR OIL PILLS.

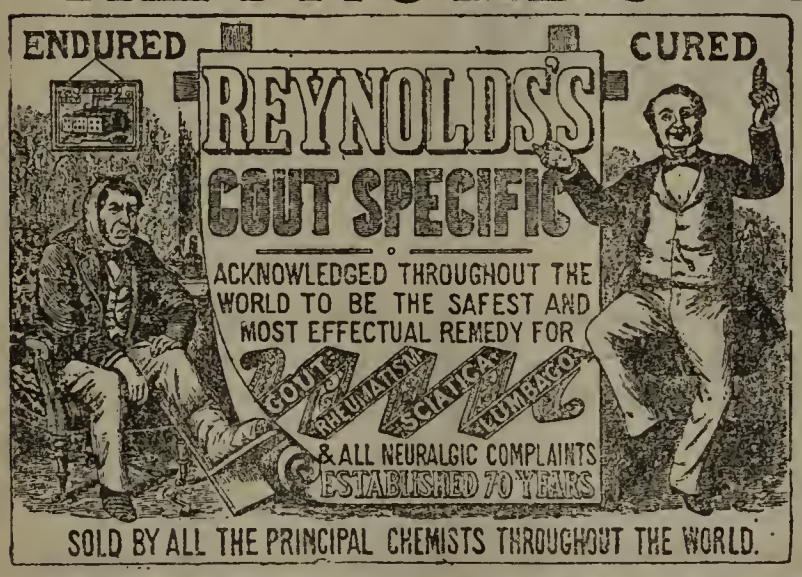
ESTABLISHED NEARLY FIFTY YEARS. REGISTERED TRADE MARK, 13556; CLASS 3.

Patent Medicine Vendors are cautioned against imitations, and are advised to insist on having WATSON'S CASTOR OIL PILLS, and these only.

Also see Signature, JAMES WATSON, on Government Stamp.

WHOLESALE AGENTS:—LONDON: Barclay & Sons, W. Edwards & Son, F. Newbery & Sons, W. Sutton & Co., J. Sanger & Sons, S. Maw, Son & Co., Hovenden & Sons, J. C. Thompson, Butler & Crispe, Burgoyne, Burbidge & Co., Grimwade, Ridley & Co. LIVERPOOL: Evans, Sons & Co. EDINBURGH: Raimes & Co., Duncan, Flockhart & Co., Sang & Barker, Clark & Pinkerton. GLASGOW: Glasgow Apothecaries' Co., Brown, Bros. & Co., Hatrick & Co. YORK: Clarke, Bleasdale & Co., Raimes & Co. THIRSK: W. Foggitt. MANCHESTER: J. Woolley & Sons. DUMFRIES: Carruthers & Allan. SOUTH AFRICA: B. G. Lennon & Co., Port Elizabeth. QUEENSLAND (Australia): Elliott, Bros. & Co., Brisbane.

REYNOLDS' GOUT SPECIFIC.



The following letter is selected from many continually reaching the Proprietor of this GREAT REMEDY:—

Chumleigh, North Devon, Oct. 25, 1882.

Dear Sir,—I have for some time recommended **Reynolds' Gout Specific** to my patients, and, I am pleased to tell you, with the best results. I have in all cases found it a most valuable and speedy remedy.

I remain, yours faithfully,
J. DALY, M.D., L.R.C.P., L.R.C.S.

Mr. T. Reynolds, Queen's Road, Twickenham.

Dr. BREWSTER (for many years one of the leading Physicians in Paris) writes:—"I have prescribed 'REYNOLDS' GOUT SPECIFIC' in ALL cases of Rheumatic affections and found it an infallible remedy. I have always had much pleasure in recommending it, and consider it a safe and invaluable medicine."

Sold in Bottles at 2s. 9d. and 4s. 6d. each, by
Messrs. BARCLAY & SON, 95, Farringdon Street, E.C.
And all Patent Medicine Vendors.

JOSEPHSON'S OINTMENT

Will be found of great benefit in the following and numerous other complaints, in many cases acting as a specific:—

Wounds of all Descriptions, Burns, Scalds, Chilblains, Soft Corns, Sunburns, Old Sores, Cuts, Chapped Hands, Blisters, Scurf, Piles, Ulcers, Boils, Sore Eyes, Stings of Insects, Pimples, Chafings, Stiff Joints, Bag Legs, &c., &c.

When applied to a wound, inflammation is reduced, pain diminished, and a speedy cure effected.

This valuable Ointment is made from the wild plants of the Australian bush, and is guaranteed to be what it is represented—A PURELY VEGETABLE COMPOUND.

It is of a pure green tint, the natural colour of the plants from which it is extracted. These plants grow nowhere except in Australia, and the Ointment can therefore only be prepared in that country. It is necessary then to beware of fraudulent imitations. FULL DIRECTIONS GIVEN WITH EACH POT.

CAUTION.—Observe that each Pot has the Registered Trade Mark, a Label bearing upon it the signatures of the discoverer and of the proprietors. Without this none is genuine.

SOLD IN POTS, PRICE 1/1½ EACH.

PREPARED SOLELY BY THE PROPRIETORS—

EDWARD ROW & COMPANY, SYDNEY, N.S.W.

AGENT FOR THE UNITED KINGDOM—

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BRYANT & MAY'S MATCHES.

10 PRIZE MEDALS.

STORRY, SMITHSON & Co.

PAINT, COLOUR, AND VARNISH MANUFACTURERS,

Tar, Turpentine, and Resin Distillers, Oil Merchants, Oil Refiners, and Boilers.

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TEREBINE, OR ELECTRIC PATENT DRYER, &c.

WORKS—BANKSIDE, SCULCOATES.

Offices: PRINCES CHAMBERS, HIGH STREET, HULL.

Paints, Colours, Oils, Varnishes, &c., put up in suitable packages for Exportation to all Climates.

ESTABLISHED 1831.

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FOULKES' CEMENT

AS USED IN ALL THE GOVERNMENT MUSEUMS.

Suited for any substance, from Glass and China to Leather, Wood, or Iron, and the articles joined bear washing in boiling water.

Professor ARCHER, Edinburgh.—"I can testify most unhesitatingly to its great utility in the various occasions which continually arise in Museum work for a first-rate cement. I have invariably found yours superior to all others, and have extensively recommended its use to all my friends."

The great success which attended its introduction, now more than twenty years ago, has given rise to a host of imitations, under as many various titles, some of these being of an exceedingly crude character, and most unsatisfactory to both vendor and buyer. The above celebrated Cement is uniformly prepared and neatly put up, and is guaranteed to remain unchanged in any climate.

Sold in Bottles at 6d. and 1s. (containing three quantities). Wholesale at the Patent Medicine Houses, or from

W. J. FOULKES, Pharmaceutical Chemist, Birkenhead.

DRUGS, CHEMICALS, PHARMACEUTICAL PREPARATIONS

GABRIEL & TROKE,

Wholesale and Export Druggists and Manufacturing Chemists,

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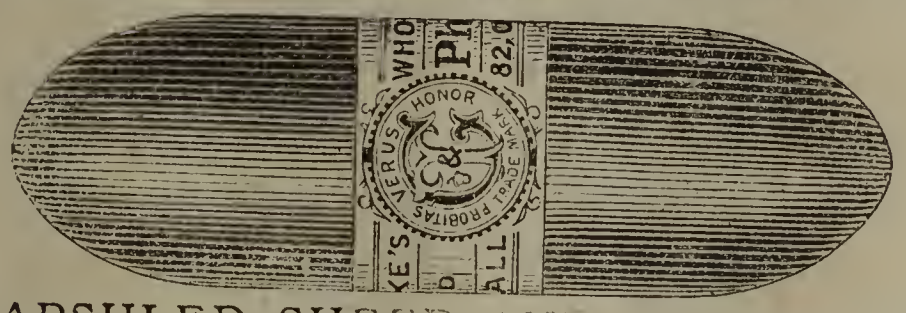
GABRIEL & TROKE'S
REGISTERED CAPSULED HORSE BALLS,



Also CAPSULED SHEEP AND CATTLE BALLS.

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☞ The superior advantages of these Balls are obvious. The mass is confined in a hermetically sealed gelatinous Capsule, perfectly harmless, and immediately dissolved in the stomach. The Capsule will not only prevent the the Ball from getting dry and hard, but will preserve its purity and power for any reasonable time, and ensure the effectiveness of the medicine—especially when such drugs as Camphor, Ammonia, or Essential Oils are prescribed. These Capsuled Balls are most convenient and safe, and well adapted for export, keeping good in any climate. They are put up in Boxes of 1 dozen each. Capsuled Balls of the most approved formulæ on hand, and private recipes faithfully and accurately dispensed.

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IN WATERPROOF, AIR-TIGHT, & ODOURLESS PACKAGES. *Protected by Royal Letters Patent.*

Is neat and clean, and convenient for use. Being air-tight and odourless, retains its strength unimpaired.
IT IS ADMIRABLY ADAPTED FOR EXPORT, AND WILL KEEP FOR YEARS IN ANY CLIMATE.

24-lb. BOXES, containing		24 1-lb.	Packages,	per Box	6/
Ditto	ditto	48 ½-lb.	ditto	,,	7/0
Ditto	ditto	96 ¼-lb.	ditto	,,	8/0
Ditto	ditto	1-lb., ½-lb., & ¼-lb.,	assorted		7/3
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50-lb. CASES, containing		50 1-lb.	Packages,	per Case	13/0
Ditto	ditto	10 5-lb.	ditto	,,	13/0
Ditto	ditto	100 ½-lb.	ditto	,,	14/0
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Also in 1 cwt. and ½-cwt. Cases, to meet the requirements of large buyers and the Export Trade.
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A Liberal Discount allowed on all Orders of 5 Cases or 10 Boxes and upwards.

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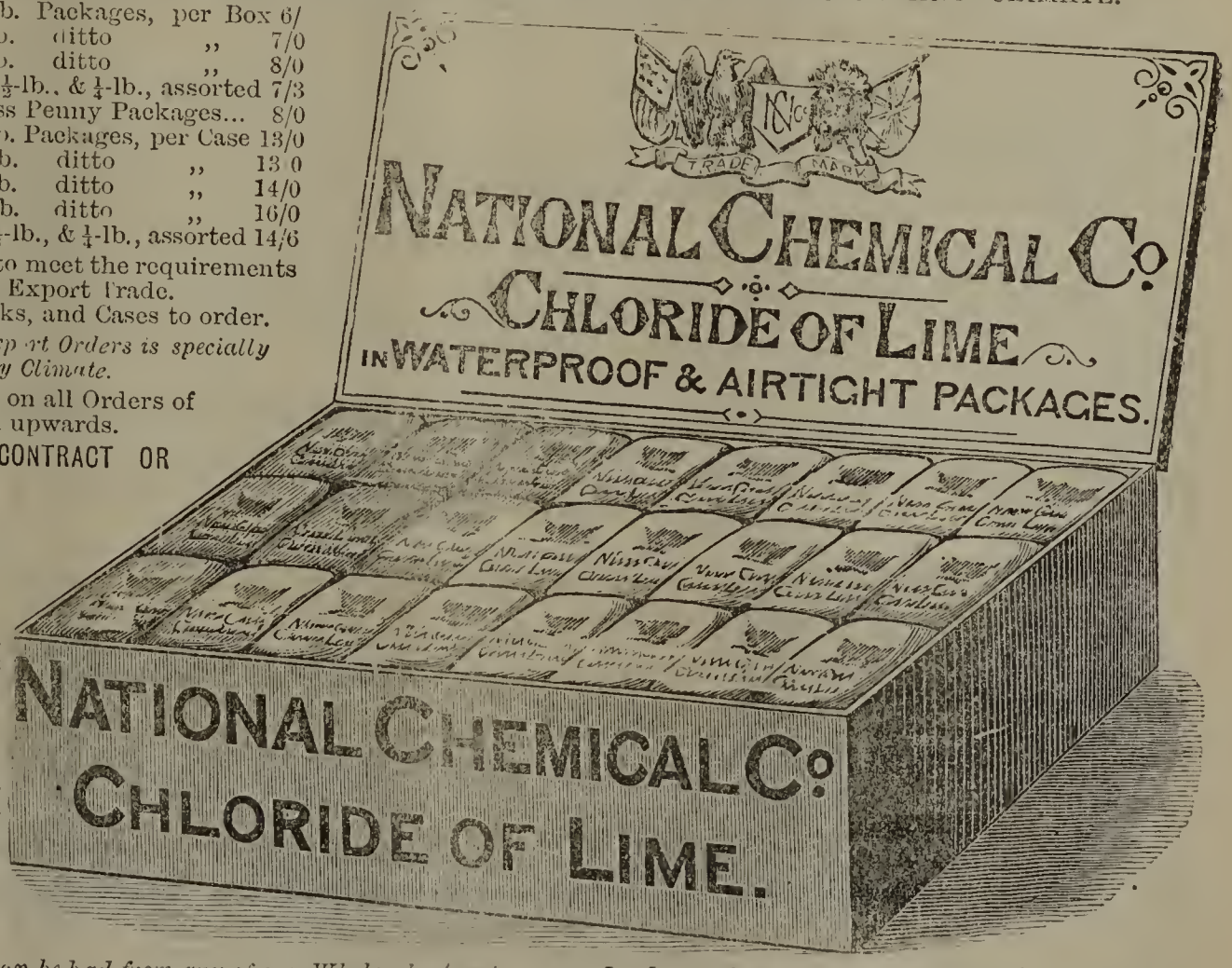

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All Goods Delivered Free in London.

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AGRICULTURAL DISTRICTS

Will save themselves much labour and trouble by introducing thoroughly to *Sportsmen and Farmers*

GOSTLING'S
HORSE & CATTLE MEDICINES.

Some Chemists have entirely discontinued making their own, as they find GOSTLING'S both to pay them well and to please their customers. The Proprietors, GOSTLING & CO., of Diss, in Norfolk, will assist any Chemist in establishing a sale, by supplying Pamphlets, &c., for distribution.

TRADE PRICE LIST.

		s.	d.		per doz. s.	d.
GOSTLING'S Cough Balls	sell	1	6	per packet ..	12	0
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87 RATS FOUND DEAD
After using Two 6*d*. Jars of
Steiner's Vermin Paste

This paste is a sure and certain destroyer of all domestic pests—Rats, Mice, Cockroaches, Black Beetles, &c. Sold by Chemists at home and in the Colonies. 6*d*. and 1*s*. glass jars; tins, 2*s*. 6*d*. Warranted to keep for Export.

Works:—HENRY STREET, LIMEHOUSE, LONDON.

TO CHEMISTS AND PATENT MEDICINE VENDORS.

MR. CUPISS, Diss, Norfolk, proprietor of the Constitution Balls, will have pleasure in supplying the trade, on application, with Bills for distribution, and Posters, which are very attractive, delivered free to any House in London, or other large town, for enclosure; and to prevent error, it is desirable to send a card of address.

W. KEMP & SON, Horncastle.

HONEY. Finest White Cuban, White Californian, White Jamaica, Pale and Yellow Chilian, Portugal, &c., in free tins and kegs.

BEESWAX. Finest French, in ½-lb. bricks; Hungarian, Jamaica, and St. Domingo in cakes. All guaranteed pure. Also genuine East Indian White Wax.

WAX. Japan Wax, Refined Wax, Imitation Beeswax, Spermacetti, &c.

FINEST NEW ESSENCE LEMON. Present or forward delivery, 9/- per lb., 5 lbs. at 8/6 per lb.

LIGHT CARBONATE MAGNESIA. In 28-lb. chests, 45/- per cwt. Quotations and samples on application, also detailed price list.

GENUINE SHEEP OINTMENT

Of standard strength (1 to 5). Manufactured with improved machinery and guaranteed equal to any made. Put up in tins and drums of all sizes to 1 cwt. (no name on label). Carriage paid. Very low quotations and favourable terms on application.

PURE CRUSHED LINSEED

Containing *all* the oil. Special attention is paid to this article, which we crush ourselves from Linseed expressly cleaned and selected for the purpose. In free bags, forwarded *freshly crushed* same day as order received. Price 18/6 cwt. Special quotations for 5 cwts. or more. Second quality, 17/6 cwt. Samples free.

PURE LINSEED MEAL, WITHOUT OIL

11/6 cwt. Bag free.

W. KEMP & SON, *Manufacturing Chemists*, Horncastle.

FOSTER'S PEARL-COATED
ROUP PILL

Retail, 2d, 6d., 1s. and 2s. per box.

These Pills have found great favour wherever introdueed, being a successful remedy for this troublesome complaint, the priee, 2d., plaeing them within reach of the poorest keeper of Fowls, Supplying a want long in demand, the high priees usually eharged preeluding all but the well-to-do Faneier.

An Agent wanted in every Town. Sample dozen of the 2d. size, post free, 1s. 6d.

Agents' addresses periodieally advertised in the Poultry Papers, thus bringing them directly before the notiee of eonsumers.

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Proprietor:

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DENNIS'S CELEBRATED LINCOLNSHIRE PIG POWDERS.

TRADE MARK. No. 14839.

THESE POWDERS have now been before the Public for Thirteen Years. The large and increasing sale, together with the numerous testimonials constantly being received, prove that the public are fully alive to the fact that they are the **BEST MEDICINE** for **DISEASES** to which **PIGS** are subject, and are also the best **CONDIMENT** known. The publicity given to this preparation ensures a good sale wherever introduced, and the Proprietor is desirous to assist all who will undertake to keep them in stock by supplying them with Show Cards, Posters, and Counter Bills, with name and address thereon. They are put up in Packets containing half-a-dozen and one dozen Powders, and Retail at Fivepenee and Tenpenee. The Fivepenny Packets in two dozen and three dozen, and the Tenpenny in one dozen boxes. Retailers will be charged **40/** per gross for Fivepenny, **80/** per gross for Tenpenny Packets, less **10%**. One Month, by

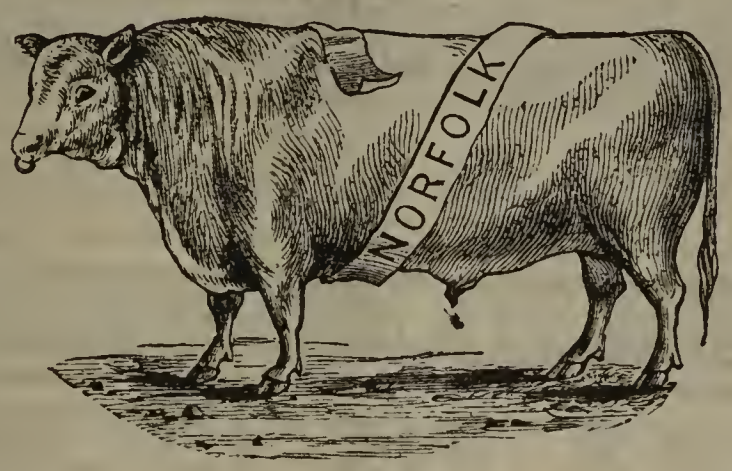
W. Sutton & Co.; Harvey, Shepherd & Co.; Hovenden & Sons; Barclay & Sons; Sanger & Sons; Newbery & Sons; and W. Edwards & Son, London. Goodall, Backhouse & Co.; Hirst, Brooke & Hirst, Leeds. Lofthouse & Co., Hull. Raimes & Co., York; and from all Wholesale Houses; or from the Proprietor,

J. W. DENNIS, CHEMIST, LOUTH, LINCOLNSHIRE, ENGLAND.

Special Notice to Chemists dealing in Veterinary Medicines.

SUTTON'S

TRADE MARK



NORFOLK

Condition Drenches

THE GREAT BLOOD MEDICINE FOR CATTLE AND SHEEP.

These Drenches are now in constant use at the Royal Farms, and their efficacy is established by the testimony of upwards of 2,000 practical Farmers and Dairy-keepers. For Cows they are simply invaluable. See the annexed voluntary Testimonial.

IMPORTANT LETTER FROM AN IRISH FARMER AND DAIRY-OWNER.

LISMOYNE, COUNTY ANTRIM, January 30th, 1881.

SIRS,—I have great pleasure in informing you that I have used your Drenches upwards of a year with my Dairy Cows, principally as a preventive of disease.

I milk my Cows and fatten them at the same time, feeding them very high summer and winter, seldom keeping them a year. Owing to the high feeding, it is very difficult to keep them in health; and my experience is that not one Cow out of twenty is able to stand the high feeding without taking some slight disorder, such as Fellon, Founder, Swollen Udders, Stoppage of Bowels, Scour, or Loss of Appetite. In all these cases I have found the "Norfolk Condition Drenches" most beneficial.

Using them as a preventive, I mix one packet among four cows' mash once a week.

I have also used your Drenches with my Sheep with good results. Yours truly, G. N. CALWELL.

More than thirty dozen of Drenches were supplied to this gentleman in 1881, and a still larger quantity in 1882.

The Proprietors have made arrangements for extensive advertising, and will readily support all Dealers who are willing to introduce them; being now all packed in Tins, they will keep any length of time.

Many Chemists are now realising good weekly returns from their sale, where well known.

In ½ doz. and 1 doz. Tins. Retail Price, 6/- and 12/- each. Wholesale Price, 8/6 per doz.
Also in 3-doz. Tins. Retail Price, 30/-. Wholesale, 22/6 each.

Subject to the usual Trade Discounts and Terms. Wholesale of all Patent Medicine Houses.

Manufacturers—F. SUTTON & CO. London Street, Norwich.

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THIRTEEN PRIZE MEDALS, FIVE GOLD.

CAUTION.—MARK YOUR LINEN WITH

BOND'S CRYSTAL PALACE GOLD MEDAL MARKING INK.

No heating required.

By Official Appointment to the QUEEN and COURT OF HOLLAND. Certificate of Merit signed H.R.H. PRINCE OF WALES.

Purveyor to the

13 PRIZE MEDALS.
5 GOLD MEDALS.

The First Order of Merit,
SILVER MEDAL,
NEW ZEALAND,
1882.

Army and Navy.

It is false as Reported by interested persons that we do NOT supply less than £100 Orders. Any quantity can be obtained.

To avoid spurious imitations, see that the words "**Daughter of the late JOHN BOND**" appear on the Labels. (*See that you get it*). The Academie Nationale Society of Manufactures and Commerce, Paris, have awarded me the Grand Diploma and Premier **GOLD MEDAL** for perfection in Marking Inks. *Extract from the "Academie Journal," April*, 1870: "We have tested fifty Marking Ink Makers' preparations since 1855, and pronounce this the most successful article."
Works: 75, SOUTHGATE RD., LONDON. *Shippers and others please send for Illustrated Price List. Free Carriage on parcels of £5 & upwards.*

THIRTEEN PRIZE MEDALS, FIVE GOLD.

DRAPER'S INK (DICHROIC).

THE NEW BLACK INK, different from anything else ever produced.

Writing becomes a pleasure when this Ink is used. It has been adopted by the principal Banks, Public Offices, and Railway Companies throughout Ireland.

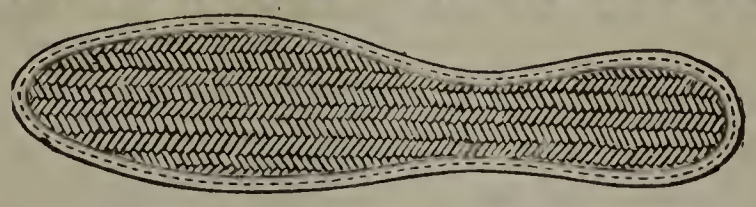
It writes almost instantly Full Black.
Does not corrode Steel Pens.
Is cleanly to use and not liable to Blot.

Flows easily from the Pen.
Blotting-paper may be applied at the moment of writing.

Can be obtained through BARCLAY'S, W. EDWARDS, NEWBERY'S, and MAW'S, London; MATHER'S, London and Manchester; GOODALL & Co., Leeds; EVANS & Co., Exeter; Mr. J. E. WILLIAMS, Chester; G. FLETCHER, Sheffield; Messrs. SANGER & SONS, 252, Oxford Street; Messrs. AYRTON & SAUNDERS, 149, Duke Street, Liverpool; JONES & Co., 98, Southwark Street, London. Sold in Jars, at 6*d*., 1*s*., and 2*s*. each.

BEWLEY & DRAPER, Limited, DUBLIN.

E. PENTON & SON'S STRAW SOCKS



HIGHLY RECOMMENDED FOR

Cold Feet, Chilblains, Rheumatism, &c.

May be obtained of—

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BOURNE & TAYLOR, 35, Castle Street, Holborn, E.C.
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HOVENDEN & SONS, 31 & 32, Berners Street, W.
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JETTINE,

The only preparation which does not injure the leather.

Produces a perfectly black and permanent gloss, which will not rub off even when wetted, nor soil the most delicate article of dress.

It is invaluable for Ladies' and Children's Boots and Shoes, Waist Belts, Travelling Bags, &c. Each bottle is neatly packed in a cardboard box, and contains a sponge mounted and ready for use: thus JETTINE may be applied without soiling the hands.

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Hovenden & Sons, 31 & 32, Berners St., W.
Lynch & Co., 192, Aldersgate St., E.C.
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E. Penton & Son, 1 and 3, Mortimer St., W.

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Superior to any in the Market. Quick as Dry Plates, giving Round and Brilliant Pictures. **Retail, 6/6 per Pint.**

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ADAMSON BROS. 13, Queen Street, Wellington Street, LEEDS { With the late HUGGON & CO.

LONDON AGENT—J. SOLOMON, 22, Red Lion Square, W.C.

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The demand for **Judson's "HOUSEHOLD Specialities"** is always greatest in the early Spring; if **Chemists** will therefore look over their stock, and order a small assortment, either from their Wholesale House, or from the Proprietors, they will, without doubt, benefit themselves and their customers at the same time.

Illustrated Price List on application. Liberal Terms.

NOTICE.—Any Chemist sending an Order (not less than 20s. net.), can at the same time return any soiled (not broken or valueless) Dyes to be exchanged.

DANIEL JUDSON & SON, 77, Southwark St. London, S.E.

TO CHEMISTS.

An Important Addition to your Business.

NUBIAN LIQUID WATERPROOF BLACKING,
THE ORIGINAL AND SELF-SHINING. ☞ NO BRUSHES REQUIRED.
Easily applied with sponge attached to the cork. Keeps its polish for a week in all kinds of weather.
Cleanest, Best, and Cheapest for Boots, Shoes, Harness, and all Leather Goods.
Price **1s.** and **2s.** per Bottle.

NUBIAN FURNITURE POLISH,
In Glass Bottles and Cartoons.
Easily applied with sponge attached to cork. Will not smear or clog, and produces a brilliant polish with little labour. Price **6d.**

LADIES' "PET" BOOT POLISH.
A Light Dressing for Ladies' and Children's Boots.
A Preparation which does not soil the most delicate clothing, and will not harden or crack the leather or peel off. Price **6d.** per Bottle.

THE NUBIAN MANUFACTURING COMPANY, 8 & 9, Hosier Lane, Snow Hill, London, E.C.

CHISWICK SOAP COMPANY,
CHISWICK, LONDON, W.

SOFT SOAP

MANUFACTURERS, WHOLESALE AND EXPORT.

"IMPERIAL" SOFT SOAP		Manufactured specially for Domestic use, and packed in 1, 2, 3, 3½, 4 and 7-lb. tins.
"FINEST PALE"	,,	Very pale Amber colour, odourless. Packed in barrels, firkins, half-firkins, and 14-lb. tins.
"BBB," "BB," "BL"	,,	The usual qualities, and kept in all packages to suit buyers.
CARBOLIC	,,	Contains 10 % Calvert's No. 5 Acid. For Dogs and Cattle, making Sheep Dip, and general disinfecting purposes. Packed in 1, 2, 4, and 7-lb. tins; 14, 28, 56, and 112 lb. iron drums.
OLIVE	,,	The B.P. "Sapo Mollis," made from finest Olive Oil and Pure Potash, in tins, firkins and jars.

Dr. CHAMBERLAIN'S
Celebrated Ophthalmic Ointment

IN USE NEARLY A CENTURY.

A POSITIVE CURE in all disorders of the EYE and EYELIDS. (*Testimonials.*)

In Pots, 1/1½, 2/9 and 4/6.

Dr. CHAMBERLAIN'S
ANALEPTIC PILLS,

AN OLD PURE FAMILY MEDICINE.

A safe and sure remedy in all cases of Debility, Nervous and Sick Headaches, Constipation, Bilious and Liver Complaints, Loss of Appetite, &c.

In Boxes, 1/1½, 2/9 and 4/6.

Wholesale Agents—BARCLAY & SONS, NEWBERY & SONS, EDWARDS & SONS, SANGER & SONS, and the principal Wholesale Chemists at Home and Abroad.

Sold in Packets, 1*d.*, 3*d.*, 6*d.* & 1*s.*

Wholesale by MAW, SON & THOMPSON, London.

SAVARS CUBEB CIGARETTES. Cubebs Stramonium and Cannabis Ind, (soothing). Relief in Asthma, Throat Cough, Bronchitis, Influenza. A specific against fogs. Boxes (12) 1s., 9s. per doz.; (36) 2s. 6d., 24s. per doz. Full directions. EVANS, LESCHER & WEBB, London. EVANS, SONS & CO., Liverpool. Samples gratis, post free.

BUTLER'S ORIGINAL
ROSEMARY HAIR CLEANER

(INTRODUCED 1850).

This popular article is now packed in *Decorated Impervious Boxes*, containing 1 dozen Packets. Retaining its virtues for any time in any climate.

New Show Cards and Bills, with Name and Address, may be had of the Proprietor, Wycombe.

To Chemists, &c.
SULPHOLINE LOTION
(FOR CURING SKIN DISEASES.)

A Handsome Enamelled Metallic Show Tablet (dimensions 12 inches by 6) for this popular article will be sent without any charge, post free, to any Chemist, on application to

JOHN PEPPER & CO. LIMITED, BEDFORD LABORATORY, BAYLEY STREET, LONDON.

CHEMISTS—NOTICE! SAUCINE

F. BIRD'S **SAUCINE**, the only article of its kind for Flavouring and thickening Gravies, Soups, and all made dishes.
F. BIRD'S **SAUCINE**. Housekeepers can make their own Sauce for Cold Meats, with a packet, at half the usual price.
F. BIRD'S **SAUCINE** is a perfect digestive and gives an appetite to the rich, and makes an ordinary meal refreshing and satisfying to the poor. *Send for Sample Order and Illustrated Bills to*

F. BIRD, CHEMIST, COVENTRY.

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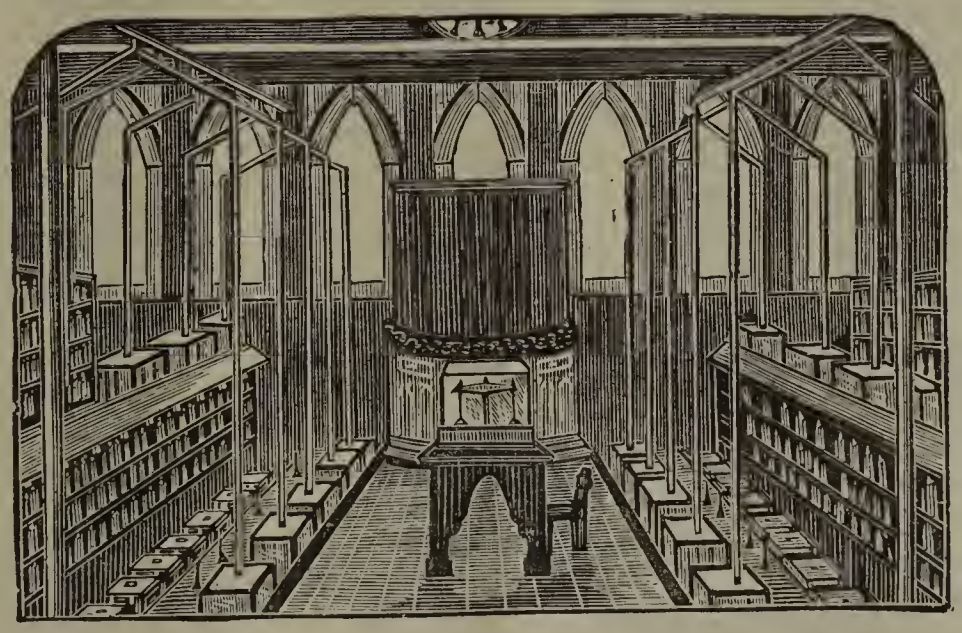

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The Pharmaceutical Journal AND Transactions.

THIRD SERIES No. 662.] SATURDAY, MARCH 3, 1883. [PRICE FOURPENCE.

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Pharmaceutical Society of Great Britain,

17, BLOOMSBURY SQUARE, LONDON.

ELIAS BREMRIDGE, Secretary and Registrar.

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EVENING MEETING.

The next EVENING MEETING will be held on Wednesday, March 7th, 1883, at Eight o'clock.

The Chair will be taken at half-past Eight *precisely*.

The following papers will be read:—

"Uranium Oleate." By Mr. WALTER GIBBONS.

"Liquid Extract of Cinchona, with data illustrating the results obtained in its preparation by the process of the British Pharmacopœia." By B. H. PAUL, Ph.D.

"Cultivation of Cinchona in Jamaica. Notes on specimens of this bark, &c., sent to the Pharmaceutical Society of Great Britain from the Government Plantations." By D. MORRIS, M.A., Director of Public Gardens and Plantations, Jamaica.

ELECTION OF COUNCIL AND AUDITORS.

EXTRACT FROM THE BYE-LAWS.

SECTION 5, CLAUSE 3.—"Any person qualified to vote desirous of nominating any Member for election as a Member of the Council or as an Auditor, shall give notice in writing, with the name and address of the nominee, and, if for the Council, disclosing whether such nominee be or not a Pharmaceutical Chemist, to the Secretary of the Society, *on or before the 24th day of March*, in every year; and the Secretary shall, on or before the 26th day of March then instant, address and sent by post to each nominee a notice of his having been so nominated, and inquiring whether he will accept office if elected, and in default of a written reply from such nominee, declaring his readiness to accept office, if elected, being received on or before the 31st day of March then instant, such [illegible] shall not be deemed eligible or willing to be elected.

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Candidates will receive notice of the date on which they will be required to present themselves.

In the practical portion of the Major Examination standard works of reference are provided for the use of Candidates at the discretion of the Examiner. No other books or memoranda are allowed.

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Sold in three tints: white, rose and cream, 2/6 per Box; double that size with puff, 4/.

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A. ROWLAND & SONS, 20, HATTON GARDEN, LONDON,

Will always be glad to advertise in any price lists, almanacks, &c., published by chemists, on receipt of particulars.

CHUBB'S BEST SEIDLITZ POWDERS

Loose, at 7s. per gross, and in boxes, at 8s. and 10s. per doz.

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In 1*d*., 6s. 6d. gross, and 2*d*., 12s. 6d. gross, boxes, and in ¼ lb. and ½ lb. packets, 10*d*. per lb.

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In 1*d*., 5s. gross, and 2*d*., 9s. 6d. gross, boxes, and in 3*d*. and 6*d*. round boxes, 2s. and 3s. 6d. dozen.

May be obtained through all the Wholesale Houses, or direct from

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DELECTABLE JUJUBES, VOICE JUJUBES, AND GLYCERINE PASTILLES,

Put up in 4-lb. Decorated Tins with Glass Lids, *TINS FREE*, are now being inquired for by buyers from all parts of the world. They are not surpassed in quality by any maker, and give entire satisfaction.

MEDICATED AND HIGH-CLASS LOZENGES, of every kind,

Sent out in 2-lb. or 4-lb. Bottles, Bottles Free; or in Tins, from 10-lb. upwards.

LIME JUICE TABLETS. MALT TABLETS.

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PENNY SUGAR WORM CAKES, suitable for either *children* or *adults*. Have an immense sale, keep in any climate, and please everybody. Manufactured by

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CAUTION.—Circumstances which have come to the knowledge of Andreas Saxlehner, Buda Pest, Sole Proprietor of the Hunyadi János Spring, compel him to WARN the British Public against SPURIOUS IMITATIONS. To secure genuineness, purchasers should see that every bottle has on the LABEL the name of

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STOMACH, LIVER & KIDNEY AFFECTIONS.

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It is prescribed by all the leading Medical Men.

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Are combinations of FRY'S PURE COCOA EXTRACT and CHOCOLATE PASTE with ALLEN & HANBURYS' CONCENTRATED EXTRACT of MALT, affording delicious beverages. The Extract may be most agreeably taken in either of these forms. Sold in tins at 1s. and 2s. each, 9s. and 18s. per dozen. The COCOA is in the form of Powder, the CHOCOLATE of PASTE, and sweetened.

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See also—*British Medical Journal*, Nov. 13th, 1880; *Medical Times & Gazette*, Jan. 1st, 1881; *Medical Press*, Jan. 26th, 1881.

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Langton, Harker & Stagg.
Lofthouse & Saltmer.
Mather, William.
Southall, Brothers & Barclay.
Sumner, R., & Co.
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These Preparations received a First-Class Award (the Highest Obtainable), at the International Medical and Sanitary Exhibition, South Kensington.

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Of all leading Wholesale and Retail houses.

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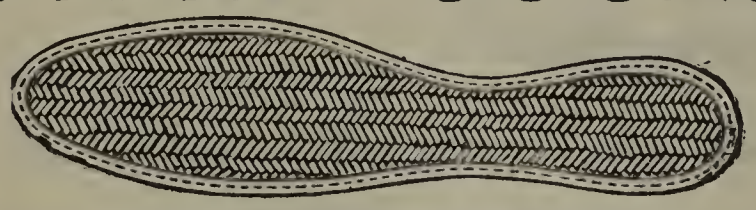

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of membrane, each containing 15 drops Pure Maranham

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SANDAL WOOD OIL.

The efficacy of these valuable medicines is due to the absolute purity of the Balsam or Oil, and to the very gradual solvability of the membrane as compared with gelatine. Copaiba, 2s. 6d., 18s. doz. Sandal, 4s. 6d., 36s. doz. Evans, Lescher & Webb, London; Evans, Sons & Co., Liverpool.

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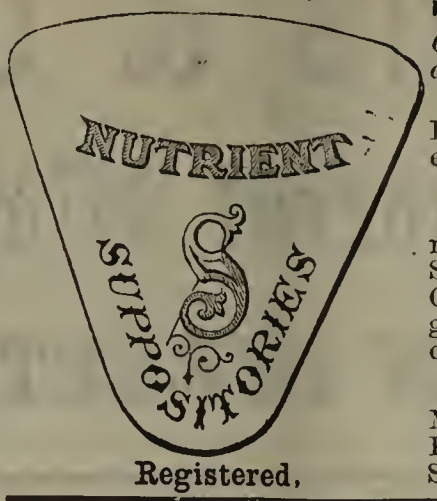

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Consisting of nearly pure Peptone and Extractive from the Artificial Digestion of Meat.

Five Suppositories contain the extractive of 20 ounces of meat, *in addition to the Peptone.*

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These FATS, *being absolutely* PURE, *and free from* SALT, CHEMICALS, *or* WATER, *are*

SPECIALLY ADAPTED FOR

PHARMACEUTICAL, PERFUMERY, *and* CULINARY *purposes.*

Manufacturers of Musk, Glycerine, Rose, Brown Windsor, Bran, Tar, Skin, Toilet, Elderflower, Oatmeal, Honey, Almond, and all other kinds of **FANCY SOAPS**, in Squares, Tablets, or Bars. Violet Powder, Pomades, Cosmetiques, &c.

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WHOLESALE AND FOR EXPORTATION.

ESTABLISHED OVER HALF A CENTURY.

TASTELESS PILLS

(COX'S PATENT.)

Dated and Sealed April 13, 1854.

Chemists selling Tasteless Pills *have an advantage over others neglecting to do so.*

We strongly recommend our Aperient Pills at 6s. and Compound Rhubarb at 7s. per pound, coated, as saleable Pills. These, or any Pills in our list, are sent out to every part of the United Kingdom in half-pound parcels, package, postage, and carriage free, on the same day as the order is received; and, to avoid booking and other expenses, 1d. in the Shilling will be allowed if stamps or P.O.O. are remitted with order.

Twenty years' success, as proved by unsolicited Testimonials from Medical Men in almost every town and village in the kingdom, has produced imitations likely to bring a useful invention into disrepute, as a large percentage of the Varnished Pills made to imitate ours pass through the stomach unaltered.

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Any Formulæ Dispensed, Covered, and Estimates given.

Samples, with a list of pills from upwards of 500 different forms which are kept in stock, will be forwarded free on application.

ARTHUR H. COX & CO. *Tasteless Pill Manufacturers,* **Brighton.**

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The Great Blood Purifier & Restorer.

The celebrated Cure for Scrofula, Scurvy, Skin and Blood Diseases, and Sores of all kinds. Wholesale of all Patent Medicine Houses, at 24*s.* and 108*s.* per dozen, less the usual discount.

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Well worth the attention of the Trade.

SPECIAL QUOTATIONS TO WHOLESALE BUYERS.

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NEW IMPROVEMENTS IN PHARMACY.

THE BURROUGHS INHALER

"Is an ingenious and convenient device for inhaling chloride of ammonium fumes; by its use the chloride of ammonium is brought in more intimate contact with the mucous surfaces of the passage of the nose and throat than by any other form of inhaler."—*The Medical Press and Circular* Reports.

For full Notes and Reports see front pages of *The Lancet*, May 6th.

KEPLER EXTRACT OF MALT.

THE LANCET says of the Kepler Extract of Malt: "The best known, und in this country the largest used Extract of Malt. It is as distinct an advance in therapeutics as was the introduction of cod-liver oil. It is one of our best remedies for atonic dyspepsia, and is undoubtedly useful in consumption and other wasting diseases." And further adds, "It is very good, and may be used with confidence."

For wasting diseases.

For full Notes and Reports see front pages of THE LANCET, May 6th.

McK. & R. CAPSULED PILLS.

An important improvement has been made, which now renders the most offensive and repulsive drugs easy of administration. This improvement consists in perfectly sealing with a thin transparent capsule of gelatine all drugs such as quinine, morphia, rhubarb, &c., also the various pills and powders of the Pharmacopœia. These capsules are of an ovoid shape, and it has been demonstrated beyond question that when ordinary coated pills are rejected by patients there is not the slightest difficulty in administering this new form.

For full Notes and Reports see front pages of THE LANCET, May 6th.

KEPLER COD-LIVER OIL WITH EXTRACT OF MALT.

This is an emulsified combination of the purest fresh Norwegian Cod Liver Oil with 50 per cent. of Extract of Malt (Kepler).

So combined, the oil is sub-divided into minute particles which can be seen under the microscope to be as fine as the granules of milk; and so much finer than any that can be obtained by any emulsion with gums. On the fineness of the emulsion depends the digestibility of the oil. "The digestive change undergone by fatty matters in the small intestine consists mainly in their reduction into a state of emulsion, or division into infinitely minute particles."

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THE BURROUGHS BEEF AND IRON WINE.

"This is a really valuable preparation, and, as far as we know, a novelty. It contains beef-juice and citrate of iron in solution in wine, and is therefore a very powerful and rapidly-acting tonic Children, as well as adults, take it easily; and, as its taste is by no means unpleasant, it can hardly fail to attain great popularity. In many cases of scrofula and rickets we have given it with the most gratifying results."—*The Lancet* Report.

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LAWTON'S ABSORBENT COTTON

"Has been pronounced by some of our most eminent surgeons the very best absorbent for taking up discharges; it is very fine and soft, and acts instantly."—*The Medical Press and Circular.*

For full Notes and Reports see front pages of *The Lancet*, May 6th.

THE WYETH COMPRESSED TABLETS

EXACT SIZE OF TABLET.

"Are a great improvement on the hard, unpalatable lozenges which have so long done duty in the Pharmacopœia. The Chlorate of Potash and Chlorate of Potash and Borax will be found useful in throat affections, whilst the Bicarbonate of Potash and Bicarbonate of Soda Tablets will prove efficacious in dyspepsia. The Soda Mint, or Neutralising Tablets, will earn the gratitude of many a flatulent dyspeptic."—*The Lancet.*

For full Notes and Reports see front pages of *The Lancet*, May 6th.

HAZELINE.

The Medical Press and Circular reports:—"Hazeline is a valuable astringent remedy, wonderfully efficacious in checking *internal* or *external hæmorrhages*, and for *allaying inflammation*. It is particularly valuable in the treatment of *bleeding piles*, and as a *surgical dressing* it deserves attention."

For full Notes and Reports see front pages of *The Lancet*, May 6th.

THE WYETH SOLUBLE COMPRESSED HYPODERMIC TABLETS.

The following formulæ and combinations embrace all those in general request. Others will be added as the demands of the profession warrant.

We claim for the Wyeth Hypodermic Tablets:

Absolute Accuracy of Dose.
Ready and Entire Solubility.
Perfect Preservation of the Drug.

Their convenience and utility will at once be apparent on examination.

Morphiæ Sulphas ....1-3 grain.	Morphiæ Sulphas ....1-8 grain.
Morphiæ Sulphas ....1-4 grain.	Atropiæ Sulphas .... 1-200 grain.
Morphiæ Sulphas ....1-6 grain.	Morphiæ Sulphas ....1-12 grain.
Morphiæ Sulphas ....1-8 grain.	Atropiæ Sulphas ....1-250 grain.
Morphiæ Sulphas ....1-12 grain.	Atropiæ Sulphas ....1-60 grain.
Morphiæ Sulphas ....1-3 grain.	Atropiæ Sulphas ....1-100 grain.
Atropiæ Sulphas ....1-120 grain.	Atropiæ Sulphas ....1-150 grain.
Morphiæ Sulphas ....1-4 grain.	Strychniæ Sulphas ..1-60 grain.
Atropiæ Sulphas ....1-150 grain.	Strychniæ Sulphas ..1-100 grain.
Morphiæ Sulphas ....1-6 grain.	Strychniæ Sulphas ..1-150 grain.
Atropiæ Sulphas ....1-180 grain.	

For full Notes and Reports see front pages of *The Lancet*, May 6th.

THE WYETH DIALYSED IRON.

1. It is easily administered, the dose being very small.
2. It has no unpleasant taste or smell.
3. It does not irritate the stomach.
4. It has no effect on the bowels, producing neither constipation nor diarrhœa.
5. It does not blacken the teeth.

In ordering please specify Fer. Wyeth 3 oz. with Dropper.

NOTE.

All the articles mentioned on this page may be obtained from respectable Dispensing Chemists and Wholesale Druggists in every part of the world, or from the European Depôt of Burroughs, Wellcome & Co., Snow Hill, London, E.C. Our new Formulæ Book and Trial Specimens of any of our Preparations will be sent to any Member of the Profession upon request.

BURROUGHS, WELLCOME & CO., Manufacturing Chemists, Snow Hill, London, E.C.

THE NEW PHARMACOPŒIAS FOR THE UNITED STATES AND GERMANY.

(*Continued from page* 623.)

ELATERINUM, U.S.P.—The unequal strength of commercial elaterium led some years ago to the introduction of a standard dilution of the active principle, elaterin, which was subsequently adopted in the public hospitals of New York under the name of "lactosum elaterini." The strength of this was one part in 100, and the dose about 10 grains (*New Remedies*, Jan., 1883, p. 28). The "trituratio elateterini" is the only preparation now official, and although the dose is not mentioned, it is probably understood to be one grain, since it is ten times the strength of the lactosum. Although a more convenient preparation, inasmuch as the bulk of the powder is smaller, the thoughtless substitution of the one preparation for the other in dispensing might lead to dangerous results. The lactosum will therefore now probably drop out of use in view of this possible risk. The non-precipitation of elaterin by tannic acid, salts of mercury and platinum is given as a test for the absence of, and difference from, alkaloids.

ERYTHROXYLON, U.S.P.—The consistence of the leaf is not mentioned. The "curved line running from base to apex" of the leaf, and formed by the vernation of the leaf is not always discernible, nor, at least as met with in this country, would the leaf be called somewhat aromatic and bitter.

EUCALYPTUS GLOBULUS, U.S.P. — The leaves should be "lanceolately scythe-shaped, 6 to 12 inches long, and "collected from rather old trees."

EUONYMUS, U.S.P.—Removed from the secondary list, probably in consequence of the discovery of the cholagogue property of euonymin by Rutherford. An alcoholic extract is the only preparation. It is probably intended to be the official representative of "euonymin."

FARFARÆ FOLIA, P.G.—The date for collection (May), and the warning against confounding the leaves of *Petasites officinalis*, Mœnch, and *P. tomentosus*, with those of coltsfoot, are now omitted; and the measurement of the leaf is given as being frequently a decimetre in length and breadth.

FEL BOVIS, U.S.P.—The sp. gr. should be 1·018 to 1·028. It is to be evaporated at a temperature of 176° F., to form *Fel Bovis Inspissatum*.

The mode of preparation of *Fel Bovis Purificatum* differs from that adopted in the B.P. in the use of only 1 part of alcohol to 3 parts of fresh ox-gall, and in the mixture being allowed to stand for twenty-four hours before evaporation.

FŒNICULUM, U.S.P.; FRUCTUS FŒNICULI, P.G.—The U.S.P. now mentions *F. vulgare*, Gærtn., and the P.G. *F. capillaceum* as the official source of the fruit. The U.S.P. permits the use of seed from 4 to 8 millimetres long, and by this measurement, as well as by simply stating "odour and taste aromatic, anise-like," without mentioning sweetness, it evidently allows the use of different varieties. The P.G. now requires fennel fruit to be 8 millimetres long and 3 broad, and to have a sweet taste, indicating probably the Maltese rather than the German fennel.

FRANGULA, U.S.P.; CORTEX FRANGULÆ, P.G.—The U.S.P. directs that the bark should be collected at least one year before being used. The P.G. does not make any such provision, although it was stated several years ago by Fristedt that the fresh bark produces colic and vomiting; and by Lamm that it is less active as an aperient than after it has been kept for a year or more (*Pharm. Journ.*, [3], vii., 102), owing possibly to changes taking place in the bark, when kept, which cause the formation of emodin, and possibly other substances (*Pharm. Journ.*, [3], vii., 616). The thickness of the bark is limited in the U.S.P. to 1 millimetre, and in the P.G. to 1½ millimetre, probably to prevent the use of the thicker stem bark, which, according to Baildon, gives a nauseous decoction (*Pharm. Journ.*, [3], iv., 889).

FUNGUS CHIRURGORUM, P.G.—This name replaces that of *Fungus igniarius præparatus*. As there is a *Polyporus igniarius*, Fr., as well as a *Polyporus fomentarius*, Fr., and the latter only is official, it is well that the name of *Fungus igniarius* is dropped. It should consist, as seen under the microscope, only of filiform cells and should quickly absorb twice its weight of water, which when expressed from it and evaporated should leave but very little residue. Amadou impregnated with nitrate of potassium or other salts is to be rejected.

GALBANUM, U.S.P. and P.G.—In the U.S.P. *Ferula galbaniflua*, Boiss. et Buhse, is alone given as the source of the drug. In the P.G. both *Ferula galbaniflua* and *F. rubricaulis* are mentioned. The U.S.P. remarks that when moistened with alcohol galbanum acquires a purple colour on the addition of a little hydrochloric acid. The P.G. states that hydrochloric acid which has been poured on galbanum becomes of a fine red colour in the course of an hour, which, on the gradual addition of spirit, if heated to 60°, becomes of an intense violet colour.

GALLÆ, U.S.P.; GALLÆ, P.G.—In the P.G. the tree yielding the official galls is stated to be *Quercus Lusitanica;* and in the U.S.P. *Q. Lusitanica*, Webb, *var. infectoria*, D.C. In the former the limit of diameter of the official galls is given as ¾ inch, and in the latter as 25 millimetres, thus excluding the large Algerian and Bussorah and other galls. The U.S.P. directs that light, spongy and whitish nutgalls should be rejected.

GELSEMIUM, U.S.P.—The rhizome and rootlets are now official. This description is more suitable to the commercial article, which usually consists in larger proportion of the rhizome. It is rarely seen in this country of the size mentioned, viz., "occasionally an inch and a quarter thick."

GENTIAN, U.S.P.; RADIX GENTIANÆ, P.G.—In the P.G. the other official species besides *G. lutea* are now mentioned. These are *G. Pannonica*, *G. purpurea*, and *G. punctata*, the roots of which are said to be more slender than that of *G. lutea*, the size of which is given as longer than 6 decimetres, and about 4 centimetres thick in the upper portion. Gentian roots should not contain starch. The roots are more correctly described than in the B.P., as transversely annulate in *the upper portion*.

GERANIUM, U.S.P.—A description of the rhizome of *G. maculatum* is now given.

GLYCYRRHIZA, U.S.P.; RADIX LIQUIRITIÆ, P.G.—The root of *G. glabra*, L., only is official in the U.S.P. "The underground stem, which is often present, has the same appearance, but contains a thin pith." In the P.G. the stolons, which have "the pith a little darker, often angular, and the cambial ring distinctly marked," are official; but both roots and stolons of Russian liquorice (*Radix Liquiritiæ mundata*) are official, and should be derived from "*Glycyrrhiza glabra* (*Glycyrrhiza glandulifera*)."

Gossypium, U.S.P.; Gossypium depuratum, P.G. —Absorbent cotton is now official. When thrown upon water it should immediately absorb the latter and sink (U.S.P.), and the water should not acquire either an acid or an alkaline reaction. On combustion it should not leave more than 0·8 (0·6 to 0·8 P.G.) per cent of ash.

Granatum, U.S.P.; Cortex Granati, P.G.—In the U.S.P. the root bark only, but in the P.G. the bark of the stem as well as that of the root is official. Under these circumstances there seems no necessity for giving in the latter the names of lichens found on pomegranate stem bark as a means of distinguishing it from that of the root, especially as *Arthonea astroidea* and *A. punctiformis* are by no means confined to the pomegranate. The stem and root bark almost always occur mixed in commerce, and as they both possess the same properties, and are not easily separated, the recognition of the fact in the P.G. is an advantage.

Grindelia, U.S.P.—The description is sufficiently indefinite to allow the use of *G. squarrosa*, although *G. robusta* is the only official species.

Guaiaci lignum, U.S.P.—The heartwood of *G. sanctum* is now official in addition to that of *G. officinale*, although "guiaci resina" is to be obtained only from the last-named species. Guaiacum wood should be a greenish-brown, containing few particles of a whitish colour, and should acquire a dark blue-green colour on the addition of nitric acid. The water test to ascertain how much alburnum is present is not given.

Hamamelis, U.S.P.—The leaves collected in autumn are official for the preparation of a fluid extract. This will hardly replace the preparations in common use, which are mostly distilled, and appear to contain comparatively little extractive matter.

Humulus, U.S.P.—The strobiles should be about 1¼ in. long, and the scales of a greenish colour.

Hyoscyamus, U.S.P.; Herba Hyoscyami, P.G. —In the U.S.P. the leaves collected from plants of the second year's growth are now official. No test for distinguishing the leaves from those of the first year's growth is given, the size of the leaf, "sometimes ten inches long and four broad," being a not uncommon size for the autumn leaves of the first year's growth of the biennial plant. This character would be almost useless as applied to the broken-up leaves met with in commerce. There are, however, good tests for distinguishing the annual from the biennial plant. See *Pharm. Journ.*, [3], i., 907, 921; and [2], xi., 134. In the P.G. the leaves and flowering stalks are official, the limit of size of the basal leaves being given as 3 decimetres long and 1 broad. The maximum dose of the leaves is 0·3 gram.

Icthyocolla, U.S.P.—The solution in 24 parts of boiling water should form on cooling a transparent jelly.

Illicium, U.S.P.—A warning is given against the use of the very similar but poisonous fruit of *Illicium religiosum*, Siebold. These are to be distinguished by the more woody shrivelled carpels, having a thin, mostly curved beak, a faint clove-like odour, and an unpleasant taste.

Inula, U.S.P.; Radix Helenii, P.G.—The root is official in the U.S.P. in the form of transverse, concave slices or longitudinal sections, and in the P.G. the rhizome and branches of the root. The P.G. observes that *Radix Helenii* does not contain starch, without alluding to its being replaced by inulin. The directions for time of collection are now omitted.

Ipecacuanha, U.S.P.; Radix Ipecacuanhæ, P.G. —The P.G. mentions *Psychotria Ipecacuanha* (*Cephaëlis Ipecacuanha*) as the source of the drug. The aqueous infusion of the root should give a copious amorphous white precipitate with solution of iodohydrargyrate of potassium. Iodine water should give a blue colour to a filtered solution, made by agitating 0·2 gram of the root with 10 grams of hydrochloric acid, and with chloride of lime a colour described as "igneum." Mr. L. R. Power has mentioned (*Pharm. Journ.*, [3], viii., p. 344) as a distinctive test for emetine the production of a *bright orange* or *lemon yellow* colour with chloride of lime, most other alkaloids being found to assume a reddish coloration with the same reagent. It would have been an improvement if directions had been given for using a weighed quantity of the bark separated from the root by bruising it, the stem, which has a very thin bark, being often present in considerable quantity in the commercial article, whereby considerable variation is liable to occur inthe official preparation.

Iridis Rhizoma, P.G., may now be obtained from *Iris Germanica* and *I. pallida*, as well as *I. Florentina*.

Iris versicolor, U.S.P.—Retained from the secondary list; it is official in the preparation of an alcoholic extract and fluid extract, the former of which would appear to be the official representative of irisin or iridin. The activity and acridity are said to be impaired by age (U.S. Dispens., 14th ed., p. 520); but the U.S.P. does not impose any limit as to the age of the root. A description of the root is given in the U.S.P., but is not sufficiently definite to distinguish the rhizome from that of other species which, in this country at least, are sometimes substituted for it.

Jaborandi Folia, P.G.—The leaves should be the produce of *Pilocarpus pennatifolius*, and their size is given as 16 centimetres long by 4 to 7 broad. In the drug market there are two varieties of jaborandi, one of which contains more alkaloid than the other, and is distinguishable by the greater prominence of the veinlets on the upper surface of the leaf, and its firmer consistence, features which may be worthy of notice in future Pharmacopœias.

Jalapa, U.S.P.; Tubera Jalapæ, P.G.—The name *Ipomœa purga* is now adopted by the P.G. while that of *Exogonium purga*, Benth., is retained by the U.S.P. According to the latter 100 parts of jalap should yield not less than 12 parts of resin, of which not over 10 per cent. should be soluble in ether. The P.G. directs that jalap should yield not less than 10 per cent. of resin, easily soluble in spirit, but not in bisulphide of carbon; also that the resin should be soluble in 5 parts of warm solution of caustic ammonia, forming a solution which should not gelatinize on cooling and should remainclear when supersaturated with acid, the residue of the liquid when evaporated being soluble in water.

Juglans, U.S.P.—The bark of *Juglans cinerea*, L. (butternut), should now be collected in autumn, and should be free from soft cork.

Juglandis, Folia, P.G.—The leaves of *Juglans regia* (walnut). The date of collection (June) is now omitted; the leaves should not be of a blackish colour.

Kamala, U.S.P., P.G.—The U.S.P. defines this

drug as consisting of the glands and hairs from the capsules of *Mallotus Philippinensis*, but the P.G. evidently holds that the powder cannot properly be placed under "Glandulæ" with lupulin, since it is given under the name of "Kamala," and is described as "indumentum fructuum." The U.S.P. gives the percentage of ash as not more than 8 per cent. ; the P.G. as not more than 6 per cent. The pure drug, according to 'Pharmacographia,' yields only about 1·37 per cent. of a grey ash. Kamala not unfrequently gives as much as 15 per cent. of ash and has been known to yield 50 per cent. A process directing its purification would therefore be an advantage.

Kino, U.S.P.—The official kino is now restricted to the inspissated juice of *Pterocarpus Marsupium*, Roxb. The inspissated juice of some species of *Eucalyptus* might perhaps yield a more satisfactory tincture (*Pharm. Journ.*, [3], ii., p. 102.

(*To be continued.*)

VEGETABLE ALKALOIDS, AND THE METHODS FOR THEIR SEPARATION.*

BY MATTHEW HAY, M.D., DEMONSTRATOR OF MATERIA MEDICA, UNIVERSITY OF EDINBURGH.

Historical and Introductory.—The alkaloids are among the most important of all the substances of the materia medica, either from a pharmaceutical or from a therapeutical aspect, for it is to their presence that a very large number, and, in many instances, the most valuable, of the natural organic drugs owe their remedial activity. That many plants possessed a highly poisonous action, and that this action when moderated might be utilized in the treatment of disease, has been known from time immemorial ; but that the activity of the plant was in the majority of cases confined, and in a highly concentrated form, to a separable alkaloidal constituent of the plant, was not anticipated until shortly after the beginning of the present century, when Sertürner, Derosne and Seguin, working each apart from the other, shared the honour of preparing in a tolerably pure state the main active principle of opium, and to which the name of morphium (Gr. μορφή, *form*,—on account of its crystalline form) was given by Sertürner. Sertürner was an apothecary of Hamelin, and Derosne an apothecary of Paris. It was the former who first clearly recognized the basic or alkaline qualities of the newly found active principle; but, although he observed in his first communication, published in 1806, that the morphium possessed an alkaline reaction, yet it was not until eleven years later, in his classic work, 'Ueber das Morphium, eine neue salzfähige Grundlage, und das Mekonsäure, als Hauptbestandtheile des Opiums," that he could write with perfect confidence as to the morphium possessing the character of a base. For his further examination of it had shown that in addition to possessing a well-marked alkaline reaction it was capable of uniting with acids to form salts. He even hazarded the opinion that in many respects it was closely related to ammonia, an opinion the correctness of which has since been amply verified, not only for morphia but for all other alkaloids.

The discovery of morphia, and the observation that it possessed the action of opium in a highly concentrated form, most naturally suggested to the minds of chemists and physicians the probability of other vegetable drugs besides opium containing an alkaloidal principle, to whose presence the activity of the drug was to be ascribed. The better known of the toxic and medicinal plants were accordingly, one after another, submitted to chemical analysis, and not without much persevering and ingenious labour were their active principles brought to light. The discovery of strychnine, brucine, quinine and cinchonine by Pelletier and his associate Caventou, of narcotine and codeine by Robiquet, of veratrine by Meissner, of caffeine by Runge, of coniine by Giesecke, of atropine by Mein, of nicotine by Reimann and Posselt, and of aconitine and hyoscyamine by Geiger and Hesse, and of several other less important alkaloids, followed in rapid succession within the sixteen years subsequent to the publication of Sertürner's completed work. Since then, almost every year has furnished its quota of separated alkaloids until at the present day their number is beyond being readily computed, and the chemistry of the alkaloids now claims for itself almost a special department in the broad and ever extending domain of organic chemistry. But, numerous as are the alkaloids which have already been separated and the plants that have been analysed for their presence, there yet remain many plants of considerable toxic activity, and presumably of some medicinal value, whose active principles have not yet been determined. Travellers and explorers, but more particularly our colonists, are bringing year after year such plants to our knowledge. And not only in newly discovered drugs is there much room for future chemical research, but even in the very drugs which have been longest known and are most used the labours of the chemist in his search for their active principles have not yet been brought to a close. For earlier investigators have sometimes failed to separate the principles in a perfectly pure state, or in certain cases to recognize that the product obtained was a mixture of various alkaloids, necessitating the separation of the one alkaloid from the other; and in other cases the drug is so rich in alkaloids, as, for example, opium, that chemists are by no means certain, when now and again we hear of the discovery of an additional alkaloid, that all the alkaloids which the drug actually contains have as yet been recognized and separated. It is not by any means Utopian to expect that the time is not far distant when our present organic materia medica, in so far as it consists of substances of highly complex and of very variable and in some instances of unknown composition, will give place to bodies with constant characters and a definite chemical constitution, the nature and extent of whose activity is to be relied upon with the greatest exactitude. We all of us can do a little to help towards the attainment of this most desirable end ; and it is because I think that all of you, as chemists, would find it both pleasurable and profitable to be engaged in so laudable a work, that I have chosen in quite a general manner to place before you, for the instruction more particularly of the younger members of your Society, an outline of the processes most commonly employed for the separation of these basic bodies which are destined to occupy a very important position in a pure organic materia medica such as I speak of. This instruction might have been unnecessary, were a description of such methods to be obtained from any of our ordinary text-books, or from other readily accessible works; indeed they are in great part to be met with only in original and separate memoirs.

The method used for the separation of each alkaloid, it is true, is fully stated in most works on materia medica ; but the operations required in the one case differ so widely in appearance from those required in the next, that, in the event of your meditating the separation of an unknown alkaloid you are quite at a loss which of the various methods to adopt ; and the probability is, even did you select one of the methods given, that it is so specially adapted for the particular alkaloid which it is designed to separate that it may absolutely fail when applied to the drug you are investigating. And here lies the difficulty in the task I have assigned to myself. For to provide you with a method, or methods, absolutely comprehensive in application, is, and probably always will be, practically an impossibility. Some alkaloids are so erratic in their chemical deportment that specially devised methods are

* Read by request before the North British Branch of the Pharmaceutical Society, Feb. 15, 1883.

necessary for their separation. I have not, however, permitted this consideration to deter me from presenting to you the principles which in all cases should guide us, and from detailing a few of the methods of most general application, in the search for an unknown alkaloid.

CHARACTERS OF ALKALOIDS.—In order that we may clearly understand these general principles and the methods based on them, it is necessary that we first consider the characters of the alkaloids. They are all of them nitrogenous organic bases; and, although the name "alkaloid" is usually applied only to such bases obtainable from plants, yet they do not differ materially from other nitrogenous organic bases which have been artificially prepared in large number during recent years, as ethylamine, aniline, pyridine and picoline; nor from the similarly constituted bodies which are met with in animals, as choline and kreatine, and the recently discovered bases of dead bodies, the so-called ptomaines. Until lately, one distinction between the artificial bases and the natural bases or alkaloids was, that the latter, in addition to possessing a more powerful and more subtle physiological action, were incapable of being prepared artificially. This distinction has failed us since Hugo Schiff, in 1870, prepared coniine synthetically from butylaldehyde, and Schmiedeberg and Harnack, six years later, obtained muscarine by the oxidation of hydroxylentrimethylammonium (neurine), and Ladenburg has all but accomplished the synthesis of atropine. The alkaloids are not, therefore, to be chemically distinguished from other nitrogenous organic bases, although the exact constitution or intra-molecular arrangement is known for only a very few of them. Much work has been done in order to determine the constitution of alkaloids, and the conclusions arrived at all agree in this, that the alkaloids are to be regarded as substitution or other products of ammonia. For our present purpose it is unnecessary to consider more fully their constitution, except to remind you of the elementary fact that, whilst the alkaloids, as a rule, contain oxygen in addition to carbon, hydrogen and nitrogen, yet a very few of them are non-oxygenated. With the exception of the latter, which, until recently, were only three in number, namely, coniine, nicotine and sparteine, but whose number has been extended to four by the discovery of piturine, all the known alkaloids are solid, and, unless under special circumstances, non-volatile bodies. The oxygen-free alkaloids are, on the other hand, volatile liquids, a character, which by enabling us to adopt the method of distillation, renders their separation a matter of easy accomplishment. The solid alkaloids are generally colourless, odourless, bitter to the taste, and, in most cases, crystallizable.

Solvents.—A knowledge of their relation to solvents is of the greatest importance in their separation. With a few exceptions (colchicine, curarine), they are either insoluble or difficultly soluble in water. In alcohol they are almost without exception, and, in most cases, tolerably freely, soluble. Ether is for many alkaloids the most active solvent we possess, but there are others which it hardly at all acts on (cinchonine, morphine, strychnine). Amylic alcohol is a very general and very capable solvent, and so also are chloroform, benzol, acetic ether and petroleum ether, although there are a very few alkaloids which are not acted on by these solvents. In fatty oils they are soluble only to a very small extent, but with the help of oleic acid they can be mixed in nearly every proportion with oils, a fact of pharmaceutical value. The solutions of the alkaloids in the various menstrua have generally a strong alkaline reaction, but in certain cases (*e. g.*, colchicine, narcotine), the reaction is extremely feeble.

Chemical relations.—Besides the action of solvents on the alkaloids, it is not of less importance, before we proceed to undertake the separation of an alkaloid, to know something of the chemical relations of the alkaloids, and more particularly of their behaviour towards acids. They comport themselves very like ammonia in most of their combinations with acids, for being bases they readily unite with acids to form salts; but, unlike ammonia, do not, as a rule, form salts with carbonic acid. If an alkaline carbonate be added to a solution of the salt of an alkaloid, the alkaloid is liberated, and carbonic acid evolved. This fact is of importance, because it enables us, when we so desire it, to set free the alkaloids by means of an alkaline carbonate, instead of employing the alkali itself, which, as in the case of atropia, may decompose the liberated base.

The salts formed with the mineral acids, as with sulphuric, hydrochloric, and nitric acids, and with the more simple of the organic acids, as acetic, tartaric, citric, oxalic, and malic acids, are highly crystalline, and are, as a rule, freely soluble in water, and still more soluble in alcohol. On the contrary, in ether, acetic ether, chloroform, amyl alcohol, benzol, and petroleum ether, they are, for the most part, completely, or almost completely insoluble. In those cases where the alkaloid *e. g.*, quinine) unites with the acid in more than one proportion, the salt containing the highest proportion of acid is, as a rule, much the most soluble. Ammonia and the alkaline bases and the alkaline earths liberate the alkaloid from its combinations with acids, and the alkaloid, if insoluble in water, is precipitated; but this precipitation may be prevented if excess of the alkali be used, as several of the alkaloids (*e. g.*, morphine) are soluble in excess of alkali, whilst all of them, with only one or two exceptions, are soluble in excess of ammonia.

It is of great service in the separation of the alkaloids that they practically, without exception, form insoluble salts with tannic acid, picric acid, the double iodide of potassium and mercury, the double iodide of potassium and cadmium, the double iodide of potassium and bismuth, iodine dissolved in iodide of potassium or in alcohol, phospho-molybdic acid, metawolframic acid, phospho-wolframic acid, and with a mixture of chloride of antimony and phosphoric acid. Further, with the double cyanide of potassium and platinum, with the chlorides of gold, platinum, iridium, palladium, and mercury, and with nitro-prusside of sodium, nearly all the alkaloids form more or less insoluble salts.

Decomposition.—It is important also to remember that the alkaloids are not as a rule very stable bodies, so that when exposed in solution to the sunlight many of them undergo gradual decomposition. Similar and other decompositions of alkaloids are more readily effected if a solution of an alkaloid is boiled for some time or is kept for too long a period at a high temperature, as is apt to occur whilst evaporating the various extracts in the processes sometimes employed for the separation of the alkaloid. Decomposition is still more liable to occur if the alkaloid be heated along with dilute mineral acids, as with hydrochloric acid; and in some instances the decomposition results in the formation of a new alkaloid more or less different in its properties and action from the original alkaloid. Solanidine is such a decomposition product of solanine, ecgonine of cocaine, tropine of atropine or hyoscyamine. In the presence of nitric acid decomposition usually occurs to a still greater extent, resulting often in the formation of reddish resinoid substances. The oxidizing action of nitric acid may exhibit itself in the production of well-characterized oxidation bodies, as cinchonic acid from cinchonine, and nicotic acid from nicotine.

Similarly, if a solution of an alkaloid be heated for some time in the presence of an alkali, the alkaloid is apt to undergo decomposition, forming in many cases methyl-, dimethyl-, and trimethylamine, and bases belonging to the pyridine and chinoline series. A few alkaloids, as atropine, are very readily decomposed in contact with alkalies even without the application of heat, so that in the course of their separation the use of free alkali, and, especially, prolonged contact of the alkaloid with the alkali, is as far as possible to be avoided.

(*To be continued.*)

The Pharmaceutical Journal.

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THE PHARMACY ACTS AMENDMENT BILL.

THE copious correspondence which we publish this week, on the subject of the Pharmacy Acts Amendment Bill, may fairly be taken as evidence of wholesome interest in the work that has so long engaged the attention of the Society's Council, and the discussions that have taken place at the several meetings reported in the present number also point in the same direction. It would perhaps be expecting too much if we sought in the various comments on the Bill for unqualified and general concurrence with all its details, and, highly as we estimate the importance of eventual agreement as to the fitness of any measure of this kind, we cannot ignore the probability of adverse opinions being formed at the outset in regard to some of the provisions contained in the Bill. The state of pharmacy in this country is still so far from being perfect, and the conditions under which the trade bearing that designation is carried on are so diverse, that these circumstances alone would insure difference of opinion as to details, and if such difference were not expressed the fact would only be indicative of an apathetic feeling in regard to the interests of the business which would be far more deplorable.

But after considering the various criticisms passed on certain clauses of the Bill there seem to be scarcely any which are radically antagonistic to the measure as a whole, while many of the objections that are apparently most cogent rest on misconception of the objects and intentions of its framers or upon misinterpretation of the scope and bearing of particular clauses. Under these circumstances, therefore, we may reasonably anticipate that when these misconceptions are corrected, and when the contemplated operation of the Bill shall be more thoroughly appreciated, there will be a very general concurrence of opinion that, if it does not secure all that might be desired, it is at least a measure which adapts itself to existing conditions, and provides as far as practicable for that advancement of pharmacy which it has always been the aim of the Pharmaceutical Society to promote.

It would be impossible within the limits of a single article to deal with all the points referred to in the discussion of the Bill by our correspondents, and we shall, therefore, on the present occasion confine our remarks to some general considerations respecting the circumstances which gave rise to the drawing up of the Bill, the extent to which there is a probability of obtaining an amendment of the law relating to pharmacy, and the expediency of conceding individual opinion for the sake of obtaining some modicum of improvement in the present position of affairs.

In the first place we will refer to the objections which have been raised to clause 2, objections which have found expression not only from members of the trade but also from some of those who took part in the framing of the Bill. It will be in the recollection of our readers that some months ago the Council of the Society submitted to the Privy Council a recommendation that certain articles should be added to the schedule of poisons and sold only in conformity with the provisions of the existing Act as regards the sale of poisons. It will also be remembered that the Privy Council refused to endorse this recommendation and that as a result of subsequent communications upon the subject the Council of the Society was requested to prepare and submit a Draft Bill for the amendment of the Pharmacy Acts. This request, while furnishing an opportunity for seeking that amendment of the law which has been so long felt necessary, was, however, associated with the proviso that the Council should, in the interests of the public, devise safeguards applicable to the sale of certain articles without interference with general trade, such as it was considered by the Privy Council would result from the addition of those articles to the Poison Schedule of the existing Act. It was simply upon this point and the restriction of sales of patent medicines containing poison that the Privy Council insisted. It was only in this light, and to this extent, that amendment of the Pharmacy Act presented itself to the consideration of the Privy Council as being desirable, and the Council of the Society, in availing itself of this opportunity for introducing a Bill for the general amendment of the law, was constrained to acquiesce in the conditions thus laid down. It will be seen, therefore, that the requirements on the part of the Government in regard to this matter were precisely such as Mr. HARRISON said he would submit to, when he moved, at the Meeting of the Executive Committee of the Trade Association, that clause 2 should be expunged from the Bill, and we venture to think that this position of the matter might have been perceived if the antecedent circumstances and the previous action of the Council of the Society had been duly considered.

It follows, therefore, from what we have above stated that any objection to clause 2 based upon the assumption that its provisions were independently originated by the Council of the Society falls to the ground, and that this clause must be regarded with tolerance, if not with

entire approval, as being the pathway by which the entire Bill was to find its way into the Legislature and furnish opportunity for removing more serious difficulties.

Having so far given an explanation of the *raison d'être* of clause 2 of the Bill, let us consider the objection that its provisions involve a breach of the principle laid down in the preamble of the Pharmacy Act, and upon which the Society has always acted since its origin. With all respect to those who hold this opinion, we look upon the objection to clause 2 on this ground as having a merely sentimental foundation. The principle recited in the preamble to the Pharmacy Act is a good and laudable one, and from the point of view of the Council of the Pharmaceutical Society it—and the means by which it is to be maintained—cannot be too constantly borne in mind; but it would be quixotic to endeavour to enforce that principle at the present time by legislative enactments interfering with general trade and with the convenience of the public, which will certainly be considered by the public itself quite as much as the Legislature will be disposed to consider its safety. We have here practical limitations beyond which it would be imprudent to attempt to enforce consideration for the sound principles of the Pharmaceutical Society.

But we will even go further than this and deal with the precise details to which the provisions of clause 2 relate. We contend that the sale of such articles as are referred to in that clause do not constitute a part of the true business of pharmacy, regarded from that abstract point of view from which it is fitting the Council of the Pharmaceutical Society should regard it. From that point of view it is not admissible that consideration for the safety of the public should be made use of as a pretext for seeking to obtain trade monopoly, and if it be insisted upon at all, as within the province of the Council representing the Society, it must be only for the purpose of imposing such restriction upon general trade as may be evidently conducive to that end. It is, we think, a total mistake to take exception to clause 2 as involving a departure from what we may call the fundamental principle of the Society. The trade in the articles referred to in clause 2 is not to be conceded to persons outside the pharmaceutical body, for they already possess the right to it, and the provisions of the clause simply limit the exercise of that right by imposing restrictions as to the future, which are all that the Government is disposed to sanction.

When the clause of the Bill now referred to is considered in this light, and with regard to the circumstances under which the Bill was proposed, there will be, we think, a great modification of the adverse opinions that have been expressed, and it must moreover be remembered that continued opposition to it might have the effect of seriously damaging the prospect of amending the Pharmacy Act altogether. If it should appear that dissension prevails within the body which seeks to obtain amended legislation, there would be the danger that the Government might confine its attention solely to that portion of the Bill which is considered to affect the interests of the general public and abandon those parts which are more essential to the pharmaceutical body as a bone of contention to be disputed over at its leisure. We trust that no such contingency is in store for the proposed Bill, but that, in accordance with the wishes expressed by many of our correspondents, its really important recommendations as a means of promoting the advance of pharmacy will be recognized so far as to ensure its being passed with the general conviction that it will do something in that direction, if not all that might be desired.

THE VALUE OF ANALYTICAL RESULTS AS INDICATIVE OF THE QUALITY OF POTABLE WATER.

From the very important annual report presented by Dr. Buchanan as Medical Officer to the Local Government Board, which has been issued within the last few days, it appears that among the auxiliary scientific investigations that have been carried on under the superintendence of the Medical Department, is one that was prompted by the observation that on many occasions sanitary authorities and their advisers had shown a tendency to estimate unduly the value of chemical analysis as a means of demonstrating the wholesomeness of drinking waters. The investigation, which was conducted by Dr. Cory, whose report is printed *in extenso* in an an appendix, had for its main object therefore to test the nature of the evidence derivable from chemical analysis, by adding various polluting matters, to a series of samples of known waters and submitting them, together with samples of the original waters, to experts for chemical examination. In a large number of the experiments the polluting material used consisted of the stools of enteric fever patients, this disease having manifested a special faculty of spreading by means of drinking water, and Dr. Buchanan selects these for the purposes of his report as conveniently showing some of the results obtained in the investigation. In the first place, as might have been expected, it was found that the customary methods of chemical analysis do not furnish any evidence to distinguish enteric fever pollution from any other form of excremental pollution, and, indeed, up to the present time chemistry fails to give any indication which will help in deciding whether such pollutions have had their source in a healthy or a diseased body. This remark applies equally to the permanganate test, and the "albumenoid ammonia" and the "combustion" processes, all of which were used. But Dr. Buchanan restricts his comments to the results obtained by the "process which is most "popularly trusted for the recognition of animal

"impurity, the amount of albumenoid ammonia "yielded by the water." A water was purposely polluted with enteric fever stool in the proportion of one grain to a gallon, and after the coarser particles had been allowed to deposit, the water was decanted and sent to Dr. DUPRÉ for analysis. Dr. DUPRÉ'S analyses showed that the resulting increment of albumenoid ammonia amounted in an average of experiments to only one-thousandth part of a grain in a gallon, or fourteen thousandths of a part per million parts. Another sample of water was purposely polluted with 3·5 grains of fever stool to the gallon and sent, with a sample of the original water, to Mr. WANKLYN, who found the yield of albumenoid ammonia to have been increased in the proportion of twenty thousandths of a part per million parts for the entire 3·5 grains, or fifty-seven ten thousandths of a part per million parts for each grain of the contaminating stool added to the gallon of water.

Of course some scepticism may be felt as to the possible influence of so minute a contamination as one grain in a gallon of water, and Dr. BUCHANAN quotes, as bearing upon this point, some figures, which though evidently liable to be affected in their meaning by many possible contingencies, have a certain value in the absence of more precise data. In an outbreak of enteric fever at Caterham, in the year 1880, nearly two hundred of the earlier attacks were traced to the use, during a fortnight, of water that had been pumped from a well in which a man had been at work while suffering from enteric fever. During this particular fortnight as much as 1,861,000 gallons of water was pumped from the well, and to have infected this quantity of water to the extent of one grain per gallon would have required the addition of 19 lbs. of excremental matter to each day's supply. Of course under the conditions stated this would have been impossible, while on the other hand, it would not follow, and indeed it is not likely, that the pollution was equally diffused throughout the whole of the water. But Dr. BUCHANAN considers the evidence is sufficient to show that one grain in the gallon is a very large amount of polluting matter to be present in a gallon of water, and one that is not likely to have been exceeded in the particular samples of Caterham water that did actually produce disease in the individuals who drank it. Since, therefore, the chemical evidence of this dangerous proportion of pollution is expressed in terms of albumenoid ammonia as low as ·014 part per million parts of water, Dr. BUCHANAN is of opinion that it is not permissible to accept the doctrines that have been formulated as to the significance of a particular amount of albumenoid ammonia present in an otherwise unknown water. With an evident reference to Mr. WANKLYN'S classification of waters, he remarks that polluting matter potent for harm might be present in a water "yielding from 0·0 up to 0·05 parts of albumenoid ammonia per million" without removing it from the rank of waters of "extraordinary organic purity;" and he denies that there is evidence that an unknown water showing from 0·05 to 0·10 parts of albumenoid ammonia per million may be assumed to be "safe organically."

The lesson which Dr. BUCHANAN believes to be taught afresh and significantly by this investigation is that whilst it is desirable to be ever on the watch for any indications that chemistry may afford of the access of contaminations to drinking waters, it is at present necessary to go beyond the laboratory for evidence that any water is free from dangerous organic pollution. In the words of Dr. BUCHANAN, "Unless the chemist is well acquainted with the "origin and liabilities of the water he is examining, "he is not justified in speaking of a water as 'safe' "or 'wholesome,' if it contains any trace whatever of "organic matter; hardly, indeed, even if it contain "absolutely none of such matter appreciable by his "very delicate methods. The chemist can, in brief, "tell us of impurity and hazard, but not of purity "and safety."

An Evening Meeting of the Pharmaceutical Society will be held on Wednesday next, at half-past eight o'clock, when a paper will be read, on "Uranium Oleate," by Mr. Walter Gibbons, and another on "Liquid Extract of Cinchona, with Data illustrating the Results obtained in its Preparation by the Process of the British Pharmacopœia," by Dr. B. H. Paul. There will also be a Note read descriptive of an important series of Cinchona specimens recently received by the Pharmaceutical Society from the Government Plantations, Jamaica.

* * *

The next meeting of the Chemists' Assistants' Association will be held on Tuesday, the 6th inst., when a paper on "Photography" will be read by Mr. C. F. Wyatt.

* * *

A meeting of the School of Pharmacy Students' Association will be held on Thursday, March 8, at 8.30 p.m., when a "Note on Dried Alum" will be read by Mr. E. Baily, and a Report on "Two New Methods for the Separation of Cadmium and Copper" will be made by Mr. C. Thompson. There will also be a Report upon "Inorganic Chemistry," made by Mr. F. W. Short.

* * *

At a meeting of the House Committee and Medical Council of the London Hospital last week a resolution was passed declaring that it was expedient that a suitable resident college for students should be established in connection with the hospital, and a Committee was appointed to consider and report on the best method for giving effect to the resolution.

* * *

Arkansas is now to add another to the numerous organizations of pharmacists already in existence in the United States. At a recent meeting it was decided to form a pharmaceutical association for the State, the head quarters being fixed at Little Rock.

Transactions of the Pharmaceutical Society.

EXAMINATIONS IN LONDON.

February 21, 22 *and* 23, 1883.

Present on each day—Mr. Carteighe, President; Mr. Atkins, Vice-President; Messrs. Barnes, Benger, Corder, Ekin, Fletcher, Gale, Greenish, Linford, Plowman, Southall, Tanner, Taylor and Thresh.

MAJOR EXAMINATION.

21*st.*—*Three* candidates were examined. *One* failed. The undermentioned *two* passed, and were declared qualified to be registered as Pharmaceutical Chemists:—

Ball, Henry .....Southport.
Dangerfield, William Henry ...Devizes.

22*nd.*—*Four* candidates were examined. *Three* failed. The undermentioned passed, and was declared qualified to be registered as a Pharmaceutical Chemist:—

Deeks, William Thomas .....Shanklin.

23*rd.*—*Four* candidates were examined. *Two* failed. The undermentioned *two* passed, and were declared qualified to be registered as Pharmaceutical Chemists:—

Prosser, Frank Henry .....Birmingham.
Wilson, Joseph.....Chislehurst.

MINOR EXAMINATION.

21*st.*—*Twenty-nine* candidates were examined. *Twenty two* failed. The undermentioned *seven* passed, and were declared qualified to be registered as Chemists and Druggists:—

Barlow, Arthur.....Hull.
Boyden, John Augustus C.....Wisbeach.
Caffyn, Ernest John .....Crawley.
Capper, Fred. William Noad ...Tetbury.
Ensor, John Thomas .....Birmingham.
Foster, Henry Simpson .....Rotherham.
Gill, Reginald .....Yeovil.

22*nd.*—*Twenty-seven* candidates were examined. *Nineteen* failed. The undermentioned *eight* passed, and were declared qualified to be registered as Chemists and Druggists:—

Davies, William ....Newcastle Emlyn.
Hadfield, James Havelock .....Manchester.
Heyes, Thomas Harry.....Bolton.
Laverty, Joshua ... .Jersey.
Lockyer, Joseph Ernest .....Deptford.
Marten, John Reed .....Brighton.
Mason, Hubert Huxley .....Clevedon.
Smith, Harry James .....Speenhamland.

23*rd.*—*Twenty-eight* candidates were examined. *Fifteen* failed. The undermentioned *thirteen* passed, and were declared qualified to be registered as Chemists and Druggists:—

Corder, Edward .....Norwich.
Passmore, Arthur Bradshaw ...Bristol.
Ranken, Charles ... .Sunderland.
Rees, David .....Newcastle Emlyn.
Robinson, Richard Fredk. Wm.Manchester.
Rye, Frank .....Northampton.
Sewell, Edward Ernest .....Whitby.
Stacey, Frederick Charles .....London.
Thomas, Daniel Griffith .....Cardigan.
Thompson, Frederic.....Scarborough.
Tilley, Joseph .....Chelmsford.
Wall, Edward John.....Peckham.
Woolliscroft, Henry.....Wrexham.

PRELIMINARY EXAMINATION.

The following certificates were received in lieu of the Society's Preliminary examination:—

Certificate of the College of Preceptors.

Widgery, John.....South Molton.

Certificates of the University of Cambridge.

Day, John Thomas ..... London.
Griffith, Martin Luther .....Weston-super-Mare.
Harrison, George William .....Reading.
Payne, William .....Wendover.
Sloan, William G. .....Barking.
Spyer, George Nathan.....London.
Thompson, Herbert.....Manchester.

Certificate of the University of Oxford.

Dorning, Herbert Rigby.....Chorley.

Provincial Transactions.

CHEMISTS AND DRUGGISTS' TRADE ASSOCIATION OF GREAT BRITAIN.

A meeting of the Executive Committee was held at the office of the Association, 23, Burlington Chambers, New Street, Birmingham, on February 19, 1883, at 12·45 p.m. Mr. Robert Hampson (London), President, in the chair. Mr. John Harrison (Sunderland), Vice-President.

Present—Messrs. Andrews (London), Arblaster (Birmingham), Barclay (Birmingham), Bell (Hull), Churchill (Birmingham), Cross (Shrewsbury), Davis (Leamington), Jervis (Sheffield), Jones (Llanrwst), Laird (Edinburgh), Mason (Liverpool), Parker (Nottingham), Paterson (Aberdeen), and the Solicitor of the Association.

The minutes of the previous meeting of the Executive were read and confirmed.

The report of the Law and Parliamentary Committee was then read. The report stated that the Committee had considered the case of a member of the Association, residing at Longton, who had been summoned under the Sale of Food and Drugs Act for having sold lime water alleged to be not of the nature, substance, and quality of the article demanded by the purchaser. The Secretary had investigated the case on the spot and explained the means by which the lime water was made, and other facts incidental to the sale of the same. A sealed sample of the lime water left by the inspector with the defendant had been analysed by the Analytical Referee of the Association, who had reported that he found that 10 fluid ounces contained 2 grains of lime, whereas the same quantity of the official B.P. lime water should contain 5·6 grains of lime, and that he could not recommend defence. The Committee consequently decided not to defend. The Committee had authorized the Assistant Secretary to investigate several cases of illegal trading in poisonous sheep dips in Scotland when the sheep dipping season again commenced. The appointment of Local Secretaries in Scotland had been considered and postponed until the Committee of the Scotch Branch had made recommendations for those posts. The appointment of Local Secretaries for London had been relegated to the London Committee, the President and Mr. Andrews being empowered to take all necessary steps in the matter. The Committee had appointed the members who had been acting as correspondents to the Association in all towns in England and Wales containing six or more chemists, Local Secretaries of the Association. The Committee had considered the advisability of instituting proceedings under the 17th section of the Pharmacy Act against two companies registered under the Limited Liability Companies Acts, and the Assistant Secretary had made purchases of poisons for that purpose, but the Committee had decided to take no further action in the matter at that time. The Committee had passed the following resolution:—"That this Committee, on behalf of the Association, beg to express their deep regret at the loss they have sustained by the death of Mr. Stead, who was a firm supporter and friend of the Association; they likewise desire to record their sympathy with his bereaved family." A considerable amount of the business of the

Association had been conducted by the Sub-Committee appointed by the Law and Parliamentary Committee to deal with urgent cases. A report of the proceedings of that Committee stated that it had held five meetings. It had considered the case of a member of the Association, against whom an action had been brought by a farmer for having sold to him a certain sheep dipping composition, which it was alleged had caused the death of several of his sheep and serious injury to others. The solicitor had expressed as his opinion that the case appeared to raise a question between the two parties themselves, not affecting the trade generally; he considered that the defendant had grounds for defence, but that the Association would not be warranted in undertaking it. The Sub-Committee had consequently decided not to defend. The Sub-Committee had considered the case of a member of the Association against whom proceedings had been taken by the Inspector of Weights and Measures, he having had in his possession certain weights which were found to be below the standard. The defendant stated that the last occasion on which he had received notice to have his weights examined was some two years previous, when he sent them for adjustment; he was quite sure he had not since that time received any notice from the inspector to have his weights examined; had he received such a notice, he would have sent them as usual. It was customary in the locality in which he resided for the inspectors to give notice of their intention to examine weights. The Sub-Committee decided that a grant of a guinea should be made to meet the law costs of the case, in preference to expending a larger sum in ordering their solicitor to watch the case for the Association. The Sub-Committee had considered the case of a member of the Association, who was threatened with an action for damages for having unskilfully and improperly treated the finger of a child in June last, and decided that the solicitor should see the plaintiff's solicitors, make further inquiries in the matter and report to them in due course.

Mr. Paterson said that with reference to the case under the Weights and Measures Act, he thought chemists should see that their weights were examined; he did not think the inspector was bound to see that chemists sent their weights to be examined.

Mr. Barclay said that the inspector had previously given the member notice that on a certain day he, the inspector, would examine the weights of traders residing in the district. He thought it was economical as well as politic on the part of the Sub-Committee to vote a guinea to meet the member's defence, because had it not done so it would have instructed the solicitor to attend the hearing for the purpose of watching the case.

It was moved by Mr. Cross, seconded by Mr. Andrews, and unanimously resolved:—"That the report now read be received, adopted, and entered on the minutes."

The Executive then went into committee to consider the case of a member of the Association, against whom proceedings were threatened for having unskilfully treated the finger of a child who was brought to him with a cut finger. It was eventually resolved:—"That the solicitor be instructed to defend a member of the Association in the event of proceedings being commenced against him for the recovery of damages for having treated a child's finger."

The report of the Finance Committee was then read.

It was moved by Mr. Andrews, seconded by Mr. Davis, and unanimously resolved:—"That the report now read be received, adopted, and entered on the minutes."

The report of the London Committee was then read. The principal portion referred to a meeting of the trade which was held at the Inns of Court Hotel in December last, the proceedings at which have already been reported in this Journal.

It was moved by Mr. Harrison, seconded by Mr. Mason and unanimously resolved:—"That the report now read be received, adopted and entered on the minutes."

It was moved by Mr. Harrison, seconded by Mr. Arblaster and unanimously resolved:—"That the following members be appointed Local Secretaries of the Association for the towns in which they reside, viz., H. Allenby (St. Albans, Herts), W. F. Chave (Hereford), J. C. Cossey (Ipswich), and A. T. Watson (Jarrow).

On the motion of Mr. Barclay, seconded by Mr. Andrews, it was unanimously resolved:—"That Mr. Alfred Wright be appointed Assistant-Secretary to the Association, *vice* Mr. G. R. Templeman."

The Draft Pharmacy Bill.

The Executive then proceeded to consider the Pharmacy Act Amendment Bill, 1883.

On the suggestion of the President it was decided to consider the Bill clause by clause.

In reply to a question from Mr. Paterson, the Secretary said the Bill made a clear distinction between scheduled poisons of the existing Pharmacy Act and certain poisonous articles to be scheduled under the amended Act.

The preamble was read and agreed to.

Clause 1 was then read.

The Solicitor said he thought it required enlarging.

The President said he thought the members should consider the principle rather than the phraseology of the Bill, which had been drafted by a very eminent authority.

Clause 1 was then agreed to.

Clause 2 was read.

Mr. Harrison said the clause just read provided an entirely new schedule of poisons, or, in the words of the Bill, "poisonous articles;" it also provided for the sale of such articles by persons not registered as chemists and druggists. It was therefore his intention to propose an amendment, because he believed that the principle enunciated by this clause was diametrically opposed to that laid down in the existing Pharmacy Acts. It had been urged in certain quarters that the sale of these so-called poisonous articles should not be restricted to chemists and druggists, because they were articles of daily use and sold in large quantities, but he thought that a poison was none the less poisonous or dangerous to the public because it was sold in considerable quantities. It would appear that a chemist might introduce a poisonous article into commerce and so long as the sale was small the trade alone would be allowed to sell it; but if the sale increased and it became of commercial importance, and consequently of some value to the trade to have the sale restricted to them, then it ceased to be a poison, and became a "poisonous article" and could be sold by anyone. Again it had been urged as a reason for the Pharmaceutical Council proposing to introduce a schedule for so-called "poisonous articles," that if they had not done so the Government would. Now if the Government had made such a proposal he would submit to it; but he would be no party to informing the Government that it might simply allow such poisons to be sold by unqualified persons on being placed in a schedule of so-called poisonous articles. The distinction which the Bill proposed to set up between "poisons" and "poisonous articles" was altogether misleading. Oxalic acid was to be treated as a poison, and could be sold by qualified persons only. Sulphuric acid, which was a stronger poison, was to be treated as a "poisonous article," and might be sold by unqualified persons. He therefore moved:—"That in the opinion of this Committee the principle laid down in clause 2 of the Pharmacy Acts Amendment Bill is so entirely contrary to the principle recited in the preamble of the Pharmacy Act, 1868, of which this Bill claims to be an amendment, that it recommends the Council of the Pharmaceutical Society to expunge the clause and schedule relating thereto from the draft copy proposed to be submitted to the Privy Council."

Mr. Cross, in seconding the amendment, said that he thought the introduction of the third schedule of so-

called "poisonous articles," which might be sold by unqualified persons, would be decidedly disadvantageous to the safety of the public and the interests of the trade.

Mr. Barclay proposed as a further amendment:—"That the articles in the special schedule, referred to in clause 2, be added to part 2 of schedule A to the Pharmacy Act, 1868."

Mr. Harrison said he would, with the permission of his seconder, readily accept Mr. Barclay's suggestion, adding words to his own amendment.

Mr. Cross consented to this arrangement.

Mr. Andrews said that some time ago the Pharmaceutical Council asked the Privy Council to add the articles contained in the special schedule under consideration to the poison schedule in the existing Act, and that it positively refused to do so.

Mr. Paterson said he thought the Pharmaceutical Council should give the trade some notice of its intention to approach the Privy Council, so that chemists might, if they thought proper, object to the proposal about to be made by the Pharmaceutical Council.

Mr. Churchill said he considered it would have been more satisfactory to the trade if the strong acids, etc., under discussion could be placed in the schedule to the existing Act. That course, however, as Mr. Andrews had stated, had been suggested to the Privy Council some months since, but the Privy Council declined to do anything of the kind, and he did not think the House of Commons would be likely to take a contrary view of the matter.

The President said that having had an opportunity of considering the matter under discussion from various points of view, he thought it desirable to support the clause, although it appeared to be an infraction of a just principle as laid down in the Pharmacy Act of 1868. It must be remembered that that Act was but a compromise: there was a flaw in every Act of Parliament, and he thought it would be to the interest of both the public and the trade to accept clause 2 of the proposed Bill as a compromise in the present position. He did not think there was any chance whatever of either Parliament or the Privy Council adopting the proposal contained in the amendment.

Mr. Arblaster moved as a further amendment:—"That clause 2 and the schedule referred to therein be expunged from the Bill."

This amendment was not seconded.

The following amendment was then put to the meeting by the President:—"That in the opinion of this Committee the principle laid down in clause 2 of the Pharmacy Acts Amendment Bill is so entirely contrary to the principle recited in the preamble of the Pharmacy Act, 1868, of which this Bill claims to be an amendment, that it recommends the Council of the Pharmaceutical Society to expunge the clause and schedule relating thereto from the draft copy proposed to be submitted to the Privy Council, and that the articles in the special schedule, referred to in clause 2, be added to part 2 of schedule A to the Pharmacy Act."

Seven voted for and 5 against the amendment. It was then put as a substantive resolution and carried.

Clause 3 was then read and agreed to.

Clause 4 was then read.

Mr. Harrison moved as an amendment:—"That the word 'and' should be inserted after the word 'contained' in the 28th line, and the words 'the name of the poison contained therein' after the word 'medicine' in the 31st line."

Mr. Mason seconded the amendment.

Mr. Paterson moved as a further amendment:—"That on and after January 1, 1885, every person manufacturing a patent medicine shall lodge with the distributor of stamps in the town or district where such patent medicine is manufactured, the name, or names, and addresses of the proprietors or of such person as shall have acquired the proprietary right in the medicine and shall cause the same to be printed on the label or wrapper of the medicine, and such persons shall be held to be liable directly and immediately for any fine that may be exigible for any infringement of the Pharmacy Acts. And in the case of foreign patent medicines it shall not be lawful to sell them until an agent shall be appointed who will accept responsibility and whose name is printed on the label in case of any infringement of the Pharmacy Act."

Mr. Laird, in seconding the amendment, said that if clause 4 of the Bill were accepted, it would involve the principle of selling poisons under the guise of patent medicines. He would accept no responsibility whatever in respect to the patent medicine question.

Mr. Paterson's amendment was then put to the meeting and lost; 2 voting for, and 8 against it.

Mr. Harrison's amendment was then put and carried.

Clauses 5, 6, and 7, were read and agreed to.

Clause 8 was then read.

Mr. Paterson moved—"That this clause be deleted." He said the Aberdeen chemists objected to being compelled to have qualified assistants, unless they were to be made responsible for the conduct of the business. It was going too far, unless the qualified man was made responsible for his own mistakes and the master relieved of responsibility.

The President said the proprietors were always the responsible persons.

The amendment was not seconded. The clause was then agree to.

Clause 9 was then read, upon which the following amendment was moved by Mr. Barclay, seconded by Mr. Harrison and carried:—"That the following words be inserted at end of the clause, viz.:—'Notwithstanding the provisions of section 16 of the Pharmacy Act, 1868, or of this Act, it shall not be lawful for any executors, administrators or trustees of a deceased pharmaceutical chemist or chemist and druggist to continue the business of such pharmaceutical chemist or chemist and druggist for a longer period than three years, unless by permission of the Council of the Pharmaceutical Society of Great Britain.'"

Clauses 10 and 11 were then read and agreed to.

Clause 12 was then read.

Mr. Paterson said it was desirable that an opportunity should be given to students and apprentices to pass their examinations as near their residences as possible. Considering that the Privy Council gave grants in aid of technical education, an effort should be made to induce them to give similar grants for special pharmaceutical education. Where schools were established and examinations held, the Pharmaceutical Society should accept the first-class certificates as sufficient evidence of the proficiency of such candidates in the branch of education for which they had obtained the certificate. The Pharmaceutical Society ought, he maintained, to examine in pharmacy and dispensing once a year at the various centres throughout the country where technical schools were established, providing a sufficient number of persons came forward for examination. He therefore moved:—"That this clause be erased from the Bill."

The amendment was seconded by Mr. Laird, and on being put to the meeting, 2 voted for and 8 against it. The clause was consequently agreed to.

Clause 13 was then read.

Mr. Paterson said that although he thought that there were few chemists who took apprentices who were not capable of passing the Preliminary examination, yet he thought it was very undesirable that they should be compelled, under the penalty of a fine, not to take an apprentice unless he has passed. He moved:—"That clause 13 be deleted from the Bill."

The amendment was seconded by Mr. Davis, and on being put to the meeting, 3 voted for and 8 against it.

The clause was consequently agreed to.

Clauses 14 and 15 were read, and amendments moved by Mr. Paterson to both, which not being seconded, the clauses were agreed to.

Clauses 16, 17, 18, 19, 20, 21, 22 and 23, were then read and agreed to.

It was moved by Mr. Harrison, seconded by Mr. Jones, and resolved, that a clause to the following effect be inserted in the Bill:—"Every person registered, or who shall be registered under the provisions of the Pharmacy Act, 1852, or of the Pharmacy Act, 1868, as a chemist and druggist, and who shall be in business on his own account, shall be exempt from serving on all juries and inquests whatsoever."

It was moved by Mr. Andrews, seconded by Mr. Mason, and resolved:—"That the officers of the Association, together with Messrs. Barclay, Jones, Mason and Paterson, be appointed a Committee to take such steps as they may deem desirable to carry out the wishes of the Executive in amending the Pharmacy Acts Amendment Bill, 1883."

It was moved by the President, seconded by Mr. Jervis, and unanimously resolved:—"That the seventh annual general meeting of the members of the Association be held in London, on Tuesday, May 22 next, and that the arrangements for the same be left in the hands of the London Committee."

It was decided to report to the Pharmaceutical Council particulars of several cases of illegal trading in which the Assistant-Secretary of the Association had collected evidence of infringements of the 15th section of the Pharmacy Act, the Association not having power to sue under that section.

THE PHARMACY ACT AMENDMENT BILL.
MEETING OF CHEMISTS AND DRUGGISTS IN EDINBURGH.

A meeting of the chemists and druggists of Edinburgh and neighbourhood was held on Thursday evening, February 22, to consider the Pharmacy Act Amendment Bill. There was a large attendance. Mr. J. R. Young was requested to preside and Mr. P. MacEwan to act as clerk of the meeting.

Mr. Young, having taken the chair, explained the steps which the Council of the Pharmaceutical Society had taken in promoting legislation for the trade. The Council, he remarked, had long been of opinion that the Pharmacy Act, 1868, had not came up to the expectations which had been formed respecting it, and two years ago it had made an endeavour to amend that Act, but owing to the condition of parliamentary affairs at that time, the Council had been unable to get the last draft Bill introduced into the House of Commons. Latterly, however, circumstances favourable to immediate legislation had arisen, and in the drafting of the new Bill the Society had been largely indebted to the efficient Committee of the Council and to the energy of the President of the Society. Regarding the sale of the "poisonous articles" contained in the schedule to this Bill, he remarked, that the Council had endeavoured to get these articles added to Schedule A, Part 2, of the Pharmacy Act, 1868; but the Privy Council was of opinion that this procedure would impose an unnecessary restriction on certain dealers. He thought that the new proposal was the best one that could be made in the circumstances, and he commended it to the favourable consideration of the meeting. He would ask the clerk to read each clause separately, so that an expression of opinion might be had on each principle involved,

On the reading of the preamble, Mr. Young explained, in reply to Mr. Noble and others, that the word "poisonous" was used to distinguish the articles contained in the schedule from "poisons" so called in the Pharmacy Act, 1868; it was not implied, however, that the ordinary poison label could not be used for "poisonous articles."

Clause 1 was read and agreed to without any discussion.

On clause 2 a long discussion took place, in which Messrs. Gilmour, Leitch, Mackenzie, Napier, Nesbit, Noble and others took part. Objections to the principle of the clause were freely made; but after explanations had been made by Mr. Young, the clause was agreed to with the reservation, proposed by Mr. Laird and seconded by Mr. Buchanan, "That advertisements mentioned in the clause be inserted in the *Edinburgh* as well as the *London Gazette*."

On clause 3 being read, Mr. Pinkerton asked the Chairman if the record to be kept would require to correspond with that required in sales by retail. Wholesale houses, he remarked, generally had at least three records, namely, the written order of the purchaser, the entry in the day-book and that in the ledger. Either of these might be held to be sufficient evidence of the sale, and he thought that the keeping of a sale of poisons book by wholesale houses would be an unnecessary hardship.

Mr. Raimes, jun., having made similar comment, Mr. Young stated in reply that all that would be required was such a record as would enable the authorities to trace the sale in any criminal case. This would not alter the customs of wholesale houses, further than it would ensure that cash sales by wholesale should be properly recorded. The clause was agreed to.

Considerable discussion took place on clause 4, particularly regarding the size of the type in which the word "poison" should be printed. No amendment was, however, proposed, and the clause with the one following it were agreed to.

When clause 6 was read, Mr. Mackenzie said that he entirely disagreed with it, because it would impose a great hardship on the retailer, involving him in undesirable litigation. He, therefore, moved as an amendment "That the party to be prosecuted be the maker and not the retailer of the patent medicine."

Mr. Billing seconded the amendment.

Mr. Nesbit moved and Mr. McLaren seconded that the clause be agreed to. After a long discussion a vote was taken, when it was found that Mr. Nesbit's motion was carried.

Clauses 7 and 8 were agreed to, and on clauses 9 and 10 being read, Mr. Mackenzie moved, "That medical practitioners should not be allowed to keep open shop unless they passed the qualifying examination of the Pharmaceutical Society." The motion not being seconded the clauses were agreed to, as were also the two clauses following.

Clauses 13 and 14 having been read, Mr. Young said that clause 13 would ensure that persons entering the trade had a proper education, while the three years' pupilage necessary for the qualifying examination would thus require to be served subsequent to registration as apprentice or student.

Mr. Mackenzie objected to the principle of the clause and held that it was inapplicable to Scotland and unjust to employers. He therefore moved "That clause 13 should stop short of the penalty provision." Mr. Leitch seconded.

Mr. Stephenson argued strongly for the insertion of the clause, which he said was framed entirely in the interests of apprentices, and would not at all militate against the interests of employers. He felt that the framers of the Bill were conferring a benefit on the trade by ensuring that persons entering it had a proper elementary education. He accordingly moved "That the support of the meeting be given to the clause." Mr. McLaren seconded.

On being put to the vote it was found that Mr. Stephenson's motion was carried by a very large majority.

The remaining clauses of the Bill were afterwards discussed and unanimously agreed to.

Subsequently a long discussion took place regarding exemption of chemists and druggists from service on juries and after the sense of the meeting had been determined, the following resolution was moved by Mr.

Stephenson and unanimously agreed to:—"Resolved that this meeting give its cordial support to the Pharmacy Acts Amendment Bill as approved by the Council of the Pharmaceutical Society, but suggests to that Council that the advertisements referred to in clause 2 of the Bill should be inserted in the *Edinburgh* a well as in the *London Gazette*."

Mr. Napier then opened a discussion on the exemption of chemists and druggists from jury service, and after many of those present had spoken on the subject, it appeared that the opinion was unanimous in favour of the extension of the present exemption to all persons qualified under the Pharmacy Acts and who are carrying on business.

Mr. Buchanan then moved a vote of thanks to Mr. Young for presiding and for so ably explaining the several points which had been under discussion. The motion being heartily responded to, the meeting separated.

GLASGOW CHEMISTS AND DRUGGISTS' ASSOCIATION.

The annual supper of this Association was held in the Alexandra Hotel, 148, Bath Street, on Wednesday evening, January 24, when about seventy gentlemen sat down to supper. Mr. Robert McAdam, of the Glasgow Apothecaries' Company, occupied the chair.

Mr. J. R. Young, in giving the toast of the evening, "The Glasgow Chemists and Druggists' Association," said that the duty could hardly have fallen into more incompetent hands, for he was altogether ignorant of the history of the Society. He had, it was true, received from the Secretary a copy of the constitution, but that document was without date, and he was left to infer that the institution might date back to the time of Melchisedec, and might be intended to last for all time. From that constitution he found that one of the objects of the Society was to promote, by lectures, essays and debates, the attainment of the abridgment of the hours of labour. If that was meant to be a continuous process, he supposed that by-and-by the profession of a druggist would mean all play and no work. Speaking without the book, however, and drawing on his own personal knowledge, he knew their society was doing a great deal of good, and its efficiency was due in no small measure to the many excellent men who had, within the last thirty or forty years, filled the President's chair. It was quite right and proper that a society such as this should exist in a city like Glasgow, and there was plenty of work for it to do. They had most exceptional facilities here for the acquirement of a knowledge of chemistry, and he had often been struck by the number of young men he had met hailing from the West of Scotland, who, though they had no connection with pharmacy, had still a very useful knowledge of the science of chemistry. Such an acquaintance was of the utmost service to any young man, for it developed in him a healthy curiosity to know as much as he could about most things, and he had no doubt that such attainment had contributed in no small degree to the accumulation of the great wealth which was in Glasgow. Mr. Young then gave a few words of advice to the younger members of the Association, and asked the company to drink the toast with all the honours, coupling it with the name of Mr. Alexander Kinninmont.

The toast was most enthusiastically pledged.

Mr. Kinninmont, in replying, gave a most interesting historical sketch of the Association and the good work it had done, and pointed out that it had still much to do. He earnestly appealed to those present to join together in keeping the Association in a thorough state of organization.

Mr. John Currie (Eglinton Street) proposed "The Medical Profession" in a felicitous speech, and coupled the toast with the name of Dr. A. M. Robertson, who replied, thanking the company for the manner in which the toast had been received.

Mr. John Walker (Glasgow Apothecaries' Company) proposed "The Pharmaceutical Society," to which toast Mr. Alexander Napier, President of the North British Branch, replied.

Mr. David Lees gave "The Edinburgh Chemists' Assistants' Association," coupling it with the name of Mr. Boa.

Mr. J. L. Hatrick, in proposing "The Visitors," gave them a hearty welcome in name of the Association, and coupled the toast with the name of Mr. Borland, of Kilmarnock, who, in reply, likewise expressed the pleasure he had in being present on such an occasion.

Mr. A. Paterson, in a few remarks, proposed "The Chairman," whose health was drunk with acclamation.

NOTTINGHAM AND NOTTS CHEMISTS' ASSOCIATION.

The usual monthly meeting of this Association was held at the Mechanics' Institute, on Tuesday, February 20, the President, Mr. R. Fitzhugh, F.C.S., in the chair. There was a good attendance.

Mr. F. H. Spenser was the lecturer for the evening and gave an interesting lecture upon the "Sun and Earth." He commenced by giving a brief description of the Ptolemaic theory, pointing out that although Pythagoras and other Greek philosophers had expounded more correct notions, it was not until the teaching of Copernicus in the 15th century that the present system was thoroughly recognized. The Copernican system was explained and the planets briefly described. The enormous size of the sun, the source of our light and heat, rendered him a suitable centre of the system, his weight being 750 times that of all the planets together, his diameter one hundred times greater than the diameter of the earth, and a train running at the rate of forty miles an hour would take seven years to perform a journey round him. Supposing a ball six feet in diameter were taken to represent the sun, a pea would suitably represent the earth. He rotated on his axis in about twenty-five and a quarter of our days. The spots on the disc found in bands on either side of his equator were mentioned and the probable eleven-yearly changes pointed out. Bode's and Kepler's laws were explained, and the lecturer showed how the investigation of the latter led to the discovery of most important scientific truths by Sir I. Newton. A brief, but clear account of the Newtonian theory and the nebular hypothesis was given, showing their strong points and failings. The excentricity of the earth's orbit, the change extending over a period of 25,868 years, was mentioned. How celestial distances could be measured was explained and the methods by which the sun's distance had been determined shown. In conclusion, the lecturer remarked that our solar system does but form one star in the host of heaven, and that the universe is governed by laws so far-seeing and perfect that we must admit with the Psalmist "the heavens declare the glory of God and the firmament showeth His handiwork."

A hearty vote of thanks was accorded to Mr. Spenser on the proposition of Mr. Fitzhugh, seconded by Mr. Wilford.

Proceedings of Scientific Societies.

CHEMISTS' ASSISTANTS' ASSOCIATION.

A meeting of this Association was held on Tuesday, February 6, the President, Mr. W. A. Wrenn, in the chair. A paper was read by Mr. W. Temple Cooper, jun., entitled "Practical Hints on the Examination of Urine."

The author began by alluding to the importance of the subject which formed the title of his paper, and gave it as an example of the uses to which the work of a student, when preparing for examination, could, in after life, be applied. Reference was made to urine in its normal state, its appearance, colour, sp. gr. and composition per thousand parts, and the fermentation it undergoes with the production of ammoniacal compounds when allowed to stand. The chief normal constituents, organic and inorganic, were mentioned and described, amongst which

were urea, uric acid, hippuric acid, creatine, creatinine, phosphates, chlorides, etc., in combination with magnesium, calcium and sodium, etc., and specimens were shown of the organic portion.

Methods for estimating urea by Dr. Russell and Mr. West, by Dupré, and others, were cited, the two former being practically demonstrated before the audience. The apparatus for the first method was kindly lent by Messrs. Cetti, Brook Street, Holborn.

Of abnormal constituents the author mentioned albumen and its tests; special reference being made to nitric acid, metaphosphoric acid and ferrocyanide of potassium in conjunction with acetic or citric acids (this forming a very delicate test).

Sugar and its qualitative and quantitative tests were described; of the former, potassic hydrate (Moore's), molybdate of ammonium with nitric acid, nitrate of silver and the fermentation process were spoken of; and of the latter Fehling's method, as recommended by Dr. Pavy, which was specially dealt with, and specimens of the reagents, both before and after the addition of the saccharine urine, were shown. The method consists in the use of the following solution:—The usual quantities of cupric sulphate, Rochelle salt and sodic hydrate per litre are taken, and of the above Fehling's solution 120 c.c. are added to—

Strong solution of ammonia (sp. gr. ·880) .	300 c.c.
Solution of sodic hydrate (sp. gr. 1·14) . .	400 c.c.
Distilled water	to 1 litre.

100 c.c. of this solution = ·05 glucose.

The ammonia prevents the precipitation of the well-known red-coloured cuprous oxide, the mixture being kept at a boiling temperature, while the urine is gradually run in until the blue colour disappears.

Amongst the precautions to be observed in the application of this test are—

(1). To use right proportions of the test reagents.

(2). To use a correctly standardized copper solution.

(3). To operate quickly; as the blue colour returns when oxygen is absorbed.

(4) To maintain ebullition from beginning to end of experiment.

(5) And performing the experiment in a flask having a cork with two glass tubes, one to emit steam and ammonia, and the other connected with the burette containing the urine to be examined by means of india-rubber tubing, dilution of urine, 1 in 10, rendering reaction more delicate.

A gravimetric method was also described, which consists of solution of the cuprous oxide in hydrochloric acid, addition of solution of ammonia in excess, and precipitation of metallic silver on addition of nitrate of silver, which is estimated as metal, 509·6 grams of which have been proved by experiment to be equivalent to 100 grams of glucose.

For the examination of bile, another abnormal constituent, the author recommended a modification of the one given in the B.P. for oleum morrhuæ.

For blood in urine, the special characters of urine thus contaminated were described, the methods adopted being microscopic and Day's tests.

The cause of urinary sediments was described, and methods given for the examination of them chemically and microscopically. A chart was shown, on which were drawn the commoner kinds of sediments, illustrating their microscopic shape and character.

In conclusion, the author alluded to such substances as rhubarb, gamboge, logwood, etc., the colouring matters of which were imparted to urine when patients were taking these medicines.

A lively discussion followed, in which the President, Messrs. Alcock, Dangerfield, Park, Parkinson, Roper, Woods and Millhouse took part.

A vote of thanks, proposed by Mr. Parkinson and seconded by Mr. Townsend, was accorded the author for his valuable paper.

Correspondence.

**** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

The Draft Pharmacy Act Amendment Bill.

Sir,—Salvation by Act of Parliament has a limited value, though it may be one difficult to define. I had almost made up my mind to shirk the somewhat hazardous task of expressing an opinion upon the probable benefits of a prospective law; but several friends have suggested that the action of the Council would be strengthened by the expressions of approbation from men of various shades of colour. I am ready to admit that my colour is a very shady one in the eyes of those who look to Acts of Parliament to help them out of pecuniary troubles. It may be that my approbation will attach to itself just that value which commonly belongs to the praise of a fool. If so, my friends are to be thanked.

I do not look for any other object in Government than the general weal; that individual is to suffer for the class, and the class for the community; that poison regulations and Pharmacy Acts should be, and must be, constructed upon such plans as facilitate the public getting their wants supplied with the least cost, the least inconvenience, and the least danger. Happy is the man who has learned that his interests lie in meeting the public requirements, and has learned how to meet those requirements in a way that is advantageous to himself at the same time. The law may compel him to learn the first of these two lessons; his own necessities and his ingenuity must teach the second. If we could clear from our minds the craving for somebody to do something for us, I think we should see that the Bill under consideration is fairly planned for its legitimate work.

It endeavours to provide that dangerous articles should be sold under such regulations as diminish the danger of their sale, and when the restriction is not carried to the point of attaining the greatest possible safety it is because the additional safety would be purchased at the cost of disproportionate inconvenience or pecuniary outlay.

I should rather have seen the dealing in "poisonous" materials limited to the hands of the educated tradesman, who would know the effects of a dose of the poisonous matter he might be selling, and the appropriate remedy to use in case of an accident; but my experience would not allow of my strongly urging this point, seeing that I have been nearly forty years behind the counter and cannot call to mind more than two or three cases when this kind of knowledge has been called into request. So insignificant a protection as my knowledge has in these cases afforded will not weigh with the public against paying 10 per cent. more for their soldering solutions or sheep dip, and when the pharmacist or other educated man does not allow his knowledge to stand in the way of his doing business in fair commercial competition with other tradesmen, the probability is that the "poisonous" goods will as effectually fall into his hands as if Parliament had decreed that no other class of traders should be allowed the privilege of such sales.

In some other points I think the Bill falls short of providing, it may be at the expense of the trader, some points of protection which I think the public might reasonably demand.

Take clause 8, which provides if a man has a branch shop he shall have a qualified assistant there. If a pharmacist in Holborn opens branch shops at Bayswater, Islington and Mile End, how many branches has he? If he has three and keeps a qualified assistant at each, he may be so much taken up with looking after the branches that his root becomes a source of danger, and it may become necessary for the botanical examiner to prove that a root is a branch also, and that a pharmacist who opens three branch shops has four branches. The clause would be improved by striking out the word "branch" before the word "shop" in the sixth line.

In the fourth clause the requirement that a nostrum containing a poison shall be labelled with the name of the patent medicine and the word poison will afford some

protection against the careless use of snch medicines, but does not afford information on one important point which might in public interest have been reasonably required. That is, that it should bear the name of the poison which it contains, so that in event of an overdose having been taken the medical attendant might know with what poison he had to deal. It is true that most of the poisoning cases occurring through the use of patent medicines have been caused by the presence of opiates of some description, but it is not improbable that the acknowledgment of the presence of the opium or other articles on the poison schedule would be a reasonable requirement.

I think the clauses attempting to fix upon the true proprietors of businesses the responsibilities which rightly belong to them are good in principle and probably advantageous in their results, as much upon the pharmacists as upon the public. They would tend to facilitate the spotting of a transgressor. I see no reason why the President of the Pharmaceutical Society should blnsh to see his name in print upon his labels, or painted over his shop door in letters as large as "Dinneford." I say this with some feeling and full knowledge of the great amount of inertia that would have to be overcome before we could educate ourselves up to this point, for, however well my name may be known to readers of the *Pharmaceutical Journal*, I am best known in my own town as W. Proctor and Son.

Now, having spoken my approbation of some clauses and my partial approbation of others, I have only to add my hope that the trade may have unity enough to sink little differences and support any measure which moves them one step in advance.

11, *Grey Street, Newcastle.* BARNARD S. PROCTOR.

Sir,—Actively engaged as I was with my fellow members of Conncil in framing the Pharmacy Act of 1868, and promoting its passage through Parliament, you will not be surprised at my watching with much interest the proceedings of each succeeding Council, more especially as to future legislation, and you will, I am sure, grant me space for some remarks on the proposed Pharmacy Bill adopted recently by the Council, and published in the Journal of February 10.

You say that this Bill is the outcome of six years' deliberation. During the earlier portion of that period I sat on the varions committees in which the subject was discussed, and remember well the arguments produced for and against certain propositions as they arose.

While I recognize much in the Bill calculated to increase the public safety, and rejoice in the evident desire of my successors in the Council to advancc the education and qualification of future pharmacists, I regret to say that I think the means proposed quite inadequate for the former purpose. The public safety is the only plea on which we can go to Parliament with any hope of a favourable response. Now we all know that the trial of Lamson brought vividly before the public the lamentable ease with which a man being, or even pretending to be, a medical man could obtain the most deadly poisons, and created a demand for greater restriction on such sales. Clause 3 of the new Bill is evidently intended as an answer to that demand; but how far, I would ask, would it effect the object? It might possibly help in some rare cases to convict a murderer; but it would not prevent murder. I take prevention in this case to be the object demanded, and justly demanded, by the public. Surely Parliament would never be satisfied with so inefficient a provision! Much greater safety may be attained by more precise restrictions, and that without inconvenience to anybody—except would-be murderers! At present a stranger applies to a chemist for (say) aconitine. He writes a prescription in due form—perhaps points to the name of "Dash Blank" on the Medical Register, and says it is his name. The chemist does not know that he is "Dash Blank," or even a medical man at all, still does not like to express a doubt.

I think it would be an advantage to the chemist to have some authoritative reason for refusing the supply. Certainly it wonld be an advantage to the public. Let it be at once enacted that in all such sales there must be personal knowledge of the applicant, or that he must be introdnced to the seller by some person known to both parties. Record of sale and signature to be kept as provided in the present Pharmacy Act. Mind, I am not speaking of the ordinary supply of such articles in the proper course of wholesale dealing, nor would I have on the special list of prohibitions any but the most intense poisons which science has of late eliminated. The prohibition would only extend to what may be called casual cases. I believe I may, in support of my opinion, say that such a proposition has been approved by the College of Physicians.

One other point I must mention on behalf of the public. Clause 8 provides that persons keeping more than one open shop shall employ a qualified assistant in "each branch shop." I think it should be in each shop, leaving no question as to "branch" or principal.

We want to encourage young men to pass our examinations; it would be wise therefore to give them every opportunity of profiting by having done so.

So much for the public. Now I must direct the attention of my brethren in the trade to a most nnjust and unnecessary hardship which this Bill will inflict on us. Clause 4 throws the penalty for insufficient labelling of poisonous patent medicines on the retailer. It is very well known that the retailer has no knowledge or power in this matter. He can only sell a patent medicine wrapped up as he buys it; if he open the package he renders it unsaleable. How then can he say whether the bottle is marked "poison"? If it be not, he is liable to a fine of £5 for a first offence, or £10 for a second. It is true that Clause 6 gives him power of recovery from his wholesale dealer, but it is ten to one he will never get it; he may have great difficulty in proving that the particular article on which he was fined was supplied to him by a particular wholesale house. Even if he obtain reimbursement of the money penalty, he will still labour under the stigma of the prosecution. This recovery clause is framed evidently for the multiplication of law-snits; five or six may be carried through bcfore the real offender is reached.

The first action should lie against the proprietor of the medicine, and this wonld be easy enough.

Again, I will suppose a case in which a retailer is fined £5 for a first offence in selling a bottle of Hunter's Chloral. He offends a second time by selling a bottle of Bunter's Nervine, and is fined £10. Can he recover the £10 from Bunter, who was in no way implicated in the first offence?

Piccadilly. GEORGE W. SANDFORD.

Sir,—At a meeting of our local Association, rather more than two years ago, I read a short paper, giving my opinion as to the direction in which the Pharmacy Act should be amended, and as the amended Bill now before us coincides in many points with the views then expressed, I feel bound to give my tribute of approval to the Council for the care it has taken to bring forward a mcasure at once reasonable and practicable.

Whatever may be thought of the effect of the Pharmacy Act, 1868, in elevating the status of the druggist, there can be no doubt that the safety of the public is now much better ensured than was the case before it became law, and the amendments proposed, being calculated to assure that safety in still greater degree, should meet with a favourable reception from the public and the Legislature.

It would occupy too much space to comment on every section of the Bill proposed, but perhaps the following brief remarks may be worthy of attention.

Section 2 grapples successfully with a serious difficulty, and as no claim to the exclusive sale of the articles specified is put forward, no charge of attempted monopoly can be made, whilst the danger of accidental poisoning is lessened, as far as is possible, by the use of the "poisonous" label being made imperative.

Section 3 provides for such cases as that of Dr. Lamson, and will ensure the registration of cash sales by wholesale houses.

With respect to section 4 and others concerning patent medicines, I have held that section 17 of the Act of 1868 was applicable to them. As no decision, however, has been given on this point, it is as well to settle the question definitely, as is now done.

The regulation as to branch shops is neccssary, and will not infringe on the just rights of anyone, whilst the powers asked for under section 10 will render it easier to find out the real proprietor of a shop, which is at present a matter of some difficulty.

Section 12 and following relate more to the internal constitution of the Society and seem calculated to strengthen it and increase its usefulness.

In conclusion, I consider that the Council has acted wisely in asking for amendments which are really measures conducive to increasing the safety of the public, and in avoiding everything which might have the appearance of grasping at a monopoly.

Let us hope that its efforts will be crowned with success.

Glasgow. ALEX. KINNINMONT.

Sir,—This Bill defines the undefined, and where it departs from the original position taken up by the Pharmaceutical Society I fail to see.

Sharp tools which leave their mark need little legislation, and knives, razors, oil of vitriol, muriatic and nitric acid, chloride of antimony, carbolic acid and pistols belong to the same category. It is far different with the occult poisons scientific resarch has lately given, and will continue to give us, which require skill in their use, discretion to prevent abuse, and registration to detect misuse. Parliament, in the interests of the State, cannot guard these too vigorously; careful thought marks this, the cardinal point of the Bill. Poison and its distribution will be placed in the hands of responsible skilled persons. This done the necessity for legislation ceases; all the other clauses are subsidiary, regulating the machinery in the best possible manner for the time being.

Few of us would care to give the great and sustained attention our Council has given to this matter to steer the pharmaceutical barque safely between the Scylla of trades unionism and the Charybdis of vested interests. I therefore ask my fellow members and chemists generally to look back on the last twenty or thirty years with unprejudiced eye to our business and its prospects in their youth, and see, if they can, the step ladder of progress, for every step is a firm footing. We have not finished, but let us with a firm will and glad hope take this one with confidence, for the future is bright for us; but let each of us remember that the strength of a chain is that of its weakest link, and that of a society to some extent of its weakest member. We must not move too quickly nor ask for too much.

GEORGE MEE.

Sir,—Having carefully watched the progress of pharmaceutical legislation for many years, I cannot, at this point, refrain from raising a jubilant note in praise of the last effort made by the Council to provide something as nearly like a perfect Pharmacy Act as the times and circumstances will permit. I am not so childish as to believe the Act will satisfy all men, but I believe it will be received with approval by a large majority, and that it will go far to meet more than one evil left untouched by the Act now in force.

That the present Act is imperfect everybody admits. It supposes that no life may be endangered except by the most potent poisons, and throws open the right to dispense medicines to the most ignorant so long as those medicines are not included in the existing poison schedule. The new Act, in providing that all persons who dispense prescriptions shall show that they are able and fit to do so, makes a wise provision which will be appreciated by all but the incompetent and unreasonable. If skill is required in the dispensing of a medicine which kills with a dose of 20 minims, precisely the same skill and knowledge are requisite for the dispensing of one which is left untouched by the schedules because it reserves its potency for a larger dose. The dispenser should be responsible, no matter what the medicine may be. In any case his concern with human health and life is equally strict.

I would fain omit allusion to the vexed question of patent medicines, but it is evident enough that the only difference between dispensing a prescription and selling a patent medicine lies in the fact that the dispenser is in one case preparing a medicine of which he, the prescriber, and probably the patient, have an accurate knowledge, while in the other all parties, excepting the proprietor of the patent, are in utter darkness, and may be running their barque on the frowning rocks of death without a warning. Surely a man who dispenses poisons, the strength of which is wrapped in the impenetrable gloom of a private formula, should be one who is responsible in the strongest sense of the word, and it appears to me that the only man who can be so responsible is he who is registered as possessing qualifications for the work he undertakes. Unfortunately, even then, he takes the responsibility without the knowledge the physician imparts on his slip of paper; that, however, he must risk. He is at least one to whom the public may refer to deliver them from the many uncertainties belonging to proprietary physic.

Heaven forbid that I should appear to come between the desolate widow and the means for her subsistence provided by her inheriting the business her husband leaves behind. I think her true interests lie not in trying to carry on a business (even with the aid of a qualified assistant), which in actual practice has so seldom proved a success in the hands of a widow. I take it to be a cruel kindness to encourage it. How many a sad story could I relate of women left stranded by a receding business, which, if disposed of when necessity came, would have made a decent provision for them. Nor must we forget that the Pharmacy Act will be sufficiently like the Medical Act to make it as absurd for an irresponsible widow to carry on the responsibilities of a pharmacy, as for the widow of a surgeon to run the risks and hazards of a medical practice. But this is my opinion only, and I am quite prepared to follow in the steps of the Council by conceding this point in favour of those who hold a different opinion. The wisdom of the Council is shown in straining a point, where no great interests are involved, and where many diverse opinions have to be conciliated.

It is a step in the right direction to put a stumbling block before those who would carry on business at several places under different names. The honest man is provided for, if he please to open a dozen shops, so long as he takes care a qualified man stands behind each counter. The public is protected and the pharmacist obtains his hardly-earned profits. But where it is needed to show who is the responsible man, so that, dispensing physic being a matter of life and death, there shall be no doubt about it, then the Act will provide that this shall be settled once for all, without resort to practices which make it as difficult to identify the owner of a business as to discover that arch-conspirator, "No. 1."

For the education clauses I thank the Council. The system of education should either be entirely "as you like it," or it should be as complete as it can be made without being positively irksome.

The late Jacob Bell, were he to revisit earth, would see in this Bill the realization of more than one of his dearest hopes, and I cannot but think that it affords many a despairing pharmacist a sight of a clear and straight way out of difficulties, which now are a source of danger and discontent.

Liverpool. JOSEPH HALLAWELL.

Sir,—The long-expected Pharmacy Amendment Bill as proposed by the Council of the Pharmaceutical Society has now appeared. Naturally, much criticism of its provisions will reach you. Our immediate private interests colour our views respecting it, but I hope that we shall be able to take an "all-round" view and recognize facts, whether they be pleasant or otherwise. Compromise seems a necessary characteristic of legislation. There as elsewhere, not being able to get all we would like to have, we take what we can get, and concede as little to the other side as we can help without exciting doubts of our own good intentions.

Now, I take it that the Government, and influential persons and associations, were determined upon two things, viz., that dangerous articles should not be sold without the purchaser being informed of their potent nature for evil as well as for all the good that their makers claimed for them. The fact that we sell so many preparations that may produce, and have produced, fatal results, yet called by the most innocent names, is certainly an anomaly in our business, where accuracy of definition and practice is matter of something like boast amongst us. Imagine our calling paregoric elixir "balsam of aniseed," or chlorodyne "concentrated cordial peppermint." Hence the need for clause 4.

With regard to the proposed schedule of "poisonous articles," we know that a monopoly of their retail sale has been decidedly refused to us, and I daresay most of us do

not wish to have it. Then surely the next best thing is to compel all sellers of these to adopt precautions similar to those that we use ourselves and comply with the requirements of clause 2.

Although in the strictly logical use of words "poisonous" may be better than "poison," yet as everybody is familiar with the latter in the practice of labelling, I should prefer that the word "poison" should serve all round. We know the difficulty of making and teaching such nice distinctions. Is this one worth the trouble even of the extra specified labels? As there are already two grades of "poisons" recognized, why not have a third? I throw out this idea with all deference, for I feel that the result of so much deliberation amongst the picked men of our body is not to be lightly esteemed.

Concerning clause 8, I fear that there are vested interests, which have been to some extent overlooked. Whilst we have been prepared for a time when none might own a business unless upon the Register, I think it would be a terrible surprise to some good business men to find that unless they pass their examination by January 1, next year, they must leave their present employment where they are giving satisfaction to their employers.

On the whole the Bill is one that I think the trade might receive with favour. It has reasonable claims and reasonable concessions, and provides, wisely, I think, for the educational needs of the future. If there seems to any to be room for cynical criticism and suggestions of unfairly interested motives, let them show "a more excellent way."

221, *West Derby Road, Liverpool.* B. DICKINS.

Sir,—The mountain in labour, after much commotion, brought forth a mouse. The Council of the Society, after six years of Herculean effort, has produced some patent fetters, not of a velvety character, but real golden manacles, in the shape of £5 and £10 penalties, and exults as much over its achievement, judging by its self-adulation at the last meeting, as a hen after depositing an addled egg. The members of the Society have never claimed to be a mutual admiration society, but rather a combination in defence of trade rights and interests.

It is expected, now that the "memorable epoch in pharmacy" has arrived, that individual members should express their very grateful thanks to the Committee for the great boon bestowed upon them, unless there are some who, like myself, fail to see any important advantages in the Bill, and not being able to comprehend, respectfully ask, What benefit of any consequence will the passing of this Act be to the trade? Without wishing to depreciate the "gigantic labour" of our much-esteemed and energetic President and those who aided him in the work, it appears to me that their labour has been entirely on behalf of the public, and of very little service to the chemist.

If the Council has been deputed by the Lord President of the Privy Council to act as a sub-committee for that department of Government which protects the people from harm arising from the slovenly sale of oil of vitriol, etc., then has it performed its duties admirably to the best of its judgment; but why the trade in the "north" or any other quarter is likely to receive the Bill with "acclamation" is beyond my understanding. In my opinion it will be regarded with indifference and general apathy, if the contemptuous comparison is not suggested. as a "much ado about nothing."

The Bill is divided into three subjects, trade, education, and the improvement in the funds of the Society. I scarcely believe our members will be much interested in others, not registered chemists, being compelled to label half a dozen acids "Poisonous." Neither do I believe that placing a poison label on all proprietary articles containing any portion of the scheduled drugs will be a wise act or a safeguard, but, on the contrary, it will increase the evil it is intended to prevent.

In most cases of injury or death from patent medicines, negligence on the part of the public, in failing to observe the printed directions and dose, are the causes of the evil, and fifty poison labels would not engage their attention, or be the safety it is assumed. Accidents will happen, in spite of every precaution the chemist may take, if the public will not look after itself. Not long since, I dispensed a cough mixture and a gargle for a gentleman of education and good position. Different shaped bottles were used and a coloured label, headed, "Not to be taken," placed on the bottle containing the gargle, and yet this intellectual person poured out his gargle and swallowed it instead of his medicine; fortunately, without any serious effects. In such cases, what is the use of a label? Negligence and failing to find relief from the dose ordered, people wilfully take more than the directions permit. Then who is to blame? The same danger attends the ordinary medicines, especially drops, prescribed daily by the physician, and carefully dispensed by the pharmacist, but on which a poison label is not allowed. If the public will not take care of itself then no Act of Parliament of this nature will succour it. How often is it the case that medicine bottles are returned without having had the demy wrapper removed, the tops only torn off to permit of the removal of the corks, the label never having been disclosed or uncovered. Many will exclaim daily it is so. People who are now unaware that certain proprietary medicines contain poison in excess doses, will by the required label have an instrument brought neatly to their hands, to carry out any nefarious act they may contemplate, whereas before and now they are entirely ignorant that such an innocent article, in one sense, can be rendered so dangerous in another.

A very important question, never yet satisfactorily defined, is, What constitutes a poison? A man may have a good proprietary article, which for half a century has been sold without a single accident arising therefrom, containing a harmless dose of nux vomica, opium, or some other narcotic, which, in itself, is not only innocuous, but highly beneficial, and therefore not a poison, but only made a poison by larger doses being taken than directed. Why not compel the licensed victualler to label every bottle of spirit he sells over his counter "Poison?" A glass of brandy or whisky many people think nutritious, but the contents of a bottle, if taken, would make a human being dead drunk. Where is the difference? Why should the minor dose of nux vomica be considered and proclaimed a poison to the injury of the proprietors of an old-established property by shaking the faith and shaking the nerves of many constant purchasers?

If man or woman be intent upon committing murder, or suicide, no label will prevent it. But the proposed increase in the number of poisonous articles to be brought before the public will add to the mischief already deplored. The Council may well leave the Government to look after the public interest, whilst they study chemists' wants, and if Government will not place these articles in the hands of men competent to distribute them, it is no fault of ours.

Phosphorus paste has for some time past been employed to destroy life. Why is not that scheduled?

Mr. Hampson gives a reason why we should support this Bill. If the Society does not introduce a clause to regulate the sale of acids, Government will. But when the educational drift is considered, I cannot see what the future pharmacist will care, any more than those of the present day, who it is that regulates the acids scheduled "poisonous."

The branch shop clause need not excite the chemists. So long as co-operative stores and corporate bodies are permitted to carry on dispensing and chemists' retail business by engaging men on the register, I see no reason why orthodox pharmacists, having capital to invest, should not embark in that they most understand, especially as they are now to be held responsible for the sins of their managers.

The most important clause affecting the future existence of the Society is undoubtedly No. 17. This arrangement I persistently advocated at the time of the incorporation, which, if then carried, would by this time have made the Society a representative institution of the whole body of chemists instead of the fragmentary part now belonging to it. To become effectual, the bye-law requiring a two guinea entrance fee for registration will have to be repealed, or the proposal will meet with few acceptances by the future pharmacist. This short-sighted policy, when insisted upon, has prevented the Society from becoming the grand institution it ought to be.

I confess myself disappointed with the Bill. Not because I have Quixotic notions, or expected any endeavour to secure a monopoly, for that cannot be; but because I see no particular good in it for the trade, and I am quite

unable to understand why "nine tenths of the Council" are so unanimous and enthusiastic over it.

I had looked forward with much interest to its publication, fully expecting, with the incessant cry for education, curriculum, higher and stiffer examinations, "no cram," that some attempt would have been made to bring a more refined business to the chemist of the future, as well as to place us of to-day on more favourable terms with the medical profession, and instead of wasting time over acids and colourmen, that our Council had endeavoured to bring dispensing to the counter of its pupils. Then might we have had reason for receiving the Bill with "acclamation." Then we might have argued, with Mr. Young, that it is one of the "best Bills which had been passed by the Council," but as it is, I cannot see how it "deals practically with all those matters which were the peculiarly crying evils of the present time." Unless the Council make some effort to provide pharmacy proper as the work for the future chemist, it is only a mockery to entice educated youths to pass through high class examinations, and a delusion to bring them to the classes, without providing for them at its close an employment suitable to their attainments.

I expected some endeavour would have been made in any new Bill to legally divide prescribing and dispensing, so that each branch of medicine should have recognized duties. For the regular trade of the chemist having hopelessly departed to the grocery and other stores, there is nothing left for the chemist but to relieve the medical men of dispensing. His only hope in the future is pure pharmacy.

This should be the aim of our examining body and Council to enable the qualified man to enter an employment befitting his past preparations, instead of launching him forth into a general dealer's, to employ his talents and highly paid for education in the sale of pennyworths of hair oil and poisonous acids.

174, *Warwick Street, Pimlico, S.W.* JOHN WADE.

Sir,—Though the "Amended Pharmacy Act" may be, and I believe is, thoroughly sound and wise in its general object and conception, yet it contains that which cannot fail to provoke adverse criticism and dissent. I allude particularly to clause No. 16, which provides that after a given date, the "Major" shall be practically "abolished." This appears to me most unwarrantable and unfair as well as unnecessary. Mr. Hampson evidently had some misgivings on this point, since he anticipates that this proposal will raise opposition on the part of some pharmaceutical chemists, and Mr. Gostling is not unconscious that "some pharmacists may feel aggrieved." My own impression is that the vast majority will feel very indignant and greatly aggrieved. Just imagine the "Royal College of Surgeons" seeking to abolish their Fellowship, simply because not one in a dozen of its members proceed to the higher diploma, and yet such a course is contemplated in the Bill just produced. Because the majority of chemists have seen fit, for their own reasons, or more probably for the want of them, to remain outside the paternal care of the Society, they must needs be promoted to the title of "pharmaceutical chemist," just when the distinction is at last beginning to be appreciated by a slowly discerning public. The qualification is to be shorn of its value by being literally thrust upon a class of druggists who never earned it, and who content themselves with the easiest attainable ingress into the trade that the law permits.

Surely this is a singular manner in which to reward apathy and unreasoning discontent! If those that were bidden persistently decline the pharmaceutic feast, it is no part for the Council to hunt up the halt and the lame. If it is really necessary for the existence of the Society that its membership should be increased, why not adopt the system that obtains in the various medical licensing bodies, increase the examination fee by such a sum as would confer life membership upon the candidate passing? This would augment our numbers; numerical augmentation, however, by no means implies increased interest. It is worthy of note that indifference and apathy are characteristic features inside as well as outside the Society. Very few, comparatively, attend the annual meetings; very few indeed appear to take any interest in the proceedings at Bloomsbury Square; and at the last election of Council, not more than a third of the members even took the trouble to fill in their voting papers. The fact is, causes quite beyond the control of the Council are operating to decrease and weaken our ranks. Competition is taking from us a variety of trade that never really pertained to our calling. A process of natural selection is going on; some of us will inevitably fall victims to the law "Survival of the fittest." It is no use blinking the fact, though it is far from delectable. One chemist will find it difficult to exist where two flourished before (Proctor). I utterly fail to see how the wholesale manufacture of pharmaceutical chemists can in any way mitigate the troubles that so unfortunately beset the business, whilst such procedure would inflict gross injustice on those who, though deriving no apparent benefit therefrom, have obtained the qualification in a proper and legitimate way.

Warrington. J. RYMER YOUNG.

Sir,—That the intended new Pharmacy Act should meet with such unanimous support in the Council augurs well; that it should meet with no criticism (friendly or otherwise) from the trade at large would indicate a supineness on the part of those for whom it is intended that might dishearten the boldest of those who for the past twelve months have laboured so earnestly and with such a splendid result to bring this Bill into shape. It is therefore with this idea that I presume upon your courtesy to allow me to lay before your readers a few friendly remarks.

In the first place, clause No. 2 seems to me the weakest part of the Bill, and were it not evident that it is a compromise between the Privy Council and our Council, I should say "leave it out altogether," since I think it is very apparent that it may create confusion and do more harm than good. For the future (if this clause pass) those of us who have been in the habit of putting a bold red poison label on carbolic acid, for instance, must label it "poisonous,"* and the public will naturally come to the conclusion that after all it cannot be so very dangerous, for whilst oxalic acid is labelled "poison," this is only poisonous, and will gradually come to treat the whole system of poison labelling with contempt. Would it not be much better to stick to the old definition of poison?

Clause 4 seems also to require a slight addition or alteration. Would it not be better to leave out the reference to the outer wrapper, and make it imperative that the inner label should indicate poison; of course, it would be much safer that both should say "poison," but if only one, then most decidedly the inner one. In many cases the outer wrapper is torn off without being looked at, whilst the inner one must remain an indication of danger (and labelled "poison"), so long as the bottle, etc., lasts. Clause 17 will no doubt meet with considerable criticism by "Minor men," who will fear being thus debarred after 1886 from qualifying as Majors. But no injustice can accrue under this clause, for whilst those who wish to become Major men can present themselves for the Minor up to July, 1886, and then pass the Major in December, 1886, those who are anxious to be enrolled under the new Act have simply to defer this examination until the first one in 1887. Those of my Major brethren who feel their dignity and title touched by this clause, I would urge to read it in conjunction with clause 12, and to rest assured the present Board will not lower the standard; therefore, let us swallow our pride and present an united front on this question, having this consolation that if we suffer, or fancy we suffer, an injury ourselves, the "future of pharmacy" will have a brighter look out. And let us recollect that the men who propose this are the very men whose names give honour to our title and who have most to lose, if any loss there can be. But in pharmaceutical politics where a Carteighe, a Hills, a Williams, a Symes, or a Schacht lead, not a shadow of discredit can fall on those who follow.

131, *Embden Street, Manchester.* J. HART.

Sir,—Mr. Schacht's objection to the second clause is intelligible and relevant. He thinks it marks a new departure, for we not only give up the privilege of being the exclusive vendors of poisons, but what is apparently a more serious concession, we recognize the right of

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* The obligation upon general traders to use the label "poisonous" would not in any way interfere with the use of the "poison" label, as at present.—ED. PH. J.

outsiders to sell them. It is discouraging that after all our efforts to raise ourselves, we should be obliged to follow what appears to be a retrogressive policy, and to ask the Legislature to distinguish between "poison" and "poisonous"—between a noun and an adjective, or as some might say, between tweedledum and tweedledee.

As a question of abstract principle, Mr. Schacht's view is the correct one, and if we had more legislators, as thoughtful and pharmaceutical as that gentleman, his opinions would be in the ascendant.

But unfortunately, what is right in the abstract is not always expedient, and now that the principles of free trade are so firmly imbedded in our legislation it is hopeless to pass any measure having even the appearance of exclusive dealing. I, therefore, think that the Council in inserting that clause has, however reluctantly, been obliged to yield to the remorseless logic of facts. At the same time the boon is of questionable value to the grocer and drysalter, clogged as it is by the irksome condition of labelling those "poisonous substances" which are to be elevated to the dignity of legislative recognition. Perhaps these "poisonous substances" will burn their fingers in more senses than one.

Sydney Smith once said that railway travelling never would be safe until a bishop was crushed in a collision; perhaps we too may say our true position will never be clearly defined until a dyspeptic Cabinet Minister takes a wrong dose.

A great noise is made when an unlucky mistake occurs in dispensing; but if a record could be obtained of the number of lives and the amount of suffering saved by the watchfulness and skill of the dispenser, the public might then appreciate our services, and generously second our attempts to improve our condition. In my time I have seen prescriptions ordering 7 drachms of prussic acid in a 3 ounce mixture instead of 72 minims; tinct. opii instead of tinct. camph. c. opio; aq. ammon. instead of aq. ammon. acetat., and many such like, which, if literally dispensed would have been mischievous, if not fatal. I am sure thousands could adduce similar testimony to the anxious supervision we all must and do exercise.

I do not see much force in Mr. Schacht's objection to clause 8. It is a just concession to qualified assistants, which I doubt not they will appreciate.

The Bill on the whole I would support with the exception of the 13th clause, compelling the Preliminary examination antecedent to apprenticeship. If the intention be to limit the number of apprentices, it will succeed; but it may put those in country districts and provincial towns to great inconvenience. I think a discretionary power on that point should have been left to us. I believe a large proportion of our best assistants come from those districts, and if they are not so apt to run to brains as town apprentices, they are thoroughly trained in all the manipulative parts of the business. If many, or the most of such are legislated out of existence, I suspect the larger towns will be the losers.

Montrose. GEO. BURRELL.

Sir,—It seems to me that the distinction, in the new draft of a Pharmacy Bill, between substances that are "poisons" and "poisonous," is too fine for Parliament or the public to appreciate. That which has poisonous properties is popularly regarded as a "poison." Should the proposed Bill become law, chemists would continue to label oil of vitriol, for example, "poison," while the huckster would label it "poisonous," and the whole affair would look like a distinction without a difference. If "dangerous" is too general a term, which might be applied to gunpowder, benzoline, and acids alike, they might be severally labelled "explosive!" "highly inflammable!" and "powerfully corrosive!" which would sufficiently warn the public, while the terms "poison" and "poisonous" were reserved for such commodities as are included in the schedules. Some amendment in this direction is desirable.

Ryde. HENRY H. POLLARD.

Sir,—I should feel obliged to be allowed a small space in your pages to express my gratitude to our worthy President and the members of the Council who have devoted so much time and consideration to the Draft Bill, recently presented to us in the *Pharmaceutical Journal*. I feel sure that the same feeling of gratitude will find an echo in the breasts of the majority of country chemists, and it cannot fail to produce an almost unanimous wish that the Bill will be successfully carried through Parliament during the present year. But while I feel grateful for the Bill as at present, I cannot help sympathizing with Mr. Schacht as to clause 2. Those fortunate enough to be situated in towns where medical men do not dispense can scarcely feel on this matter like the chemist whose lot is cast in less pleasant places, and who gets comparatively very little dispensing, but has to contend against drysalters and herbalists, who, in many instances, carry on, to all intents and purposes, a chemist's business, with the exception of the sale of the present scheduled poisons. I feel strongly on this point, because of late we have had many instances in this town where patent medicines have been retailed by the above tradesmen with serious results.

I beg to enclose you a report of a case which came before our magistrates lately, in which a herbalist of this town supplied belladonna root among other things, the result proving almost a fatal one. One of the magistrates himself, in this case, told me shortly after the trial, that the sale of such powerful medicines by incompetent persons must be discouraged.

In another case, a customer of mine assures me that another herbalist in the town "nearly did for his wife a short time ago."

These are doubtless only a few of thousands of cases which occur, and which point to the necessity for more stringent regulations regarding not only "poisonous" articles, but other powerful medicines of the Pharmacopœia. In fact I should wish myself to see the sale of all B.P. preparations reserved to the chemist; but unfortunately chemists cannot always have what they like, and we should feel thankful if we succeed in passing th present proposed amendments.

21, *High Street, Hanley.* EDMUND JONES.

Sir,—I venture to remark on the Bill, printed on pp. 644-646 of the *Pharmaceutical Journal*. Paragraph 4 contains the words "unles sthe box, bottle, package or vessel in which the same is contained, the wrapper, if there be only one, or the outermost wrapper, if there be more than one, be labelled," etc.

Now, I presume that one object sought is to have introduced a higher degree of safety than now obtains, by the addition of the word "poison" to the "vessel," etc., containing such poison so long as any of the poison remains in it. This will not be effected if the immediately containing vessel be not also labelled "poison," as outermost wrappers are commonly destroyed.

The remedy: *after* "is contained" *insert* "and."

Paragraph 2 contains an annoying alteration of terms in use by the introduction of the term "poisonous." Most of us are provided with labels for the five drugs named, *e.g.*, "Nitric Acid, Poison." Why compel us to procure a fresh stock of labels, which are only too seldom used by small men like myself?* And why compel me to label a belladonna plaster "poison" (affixing name and address, that I may be found in case some cuddie's sweetheart be driven by hunger to eat shoeleather), yet oblige me to use the diminutive "poisonous" to the deadly carbolic acid?

Lastly, I should like to see introduced the compulsory prosecution of the unqualified men who sell poisons and poisonous preparations without hindrance under the labels of registered men, with their own labels (and more frequently), with a false one, or none at all.

Farnworth, Bolton. D. OGILVIE EVANS.

Sir,—I wish briefly to mention a few considerations on clause 8. to which I fancy the Council have not given sufficient weight.

Branch businesses, whether defensible or not, abound in some towns, notably here in Liverpool, where there are to my knowledge sixty-seven.

It may be taken for granted, I think, that in a large majority of cases, unqualified men (using the term in a legal sense) have charge of them. Some of these are of middle age, and some married. If this clause comes into force on January 1, 1884, I can foresee that it will produce quite a revolution of the trade here as well as in some other towns.

First. There could hardly be the requisite number of

* See the footnote on p. 733.

"qualified" men ready by that time to take charge of those numerous businesses; and secondly a large number of men would be thrown out of employ, and to some, I fear, it would mean actual ruin, *e.g.*, married men, for the latter would not be required in businesses under the principal.

For my part, I wish branch businesses were not legal; but, seeing that the evil exists, I must go with the majority in the Council in believing that they ought to be regulated. But I differ with them as to the date from which such a great change should commence.

For the sake of the men employed and for the sake of the public, who might be seriously inconvenienced by the sudden closing of some businesses useful to the community, I should advise that another year at least should elapse before that clause is allowed to operate.

Walton, Liverpool. JOHN J. SMITH.

Sir,—The promotion of a new Pharmacy Bill by the Pharmaceutical Society, which is intended to be the consummation of the policy of the last forty years, is an occasion which calls above everything for the loyalty of the pharmaceutical body. No doubt this will be generally felt, but pharmacists will be asking themselves to whom or to what is their loyalty due; and as a looker-on is proverbially best able to see the points of the game, I beg your permission to propose an answer.

The loyalty in question must not be claimed for the Society by reason of anything it has done in the past, though that is the best reason for trusting (or mis-trusting as the case may be) its present action, nor for the memory of those honoured men who guided it through its earlier difficulties, nor for those who preside over it now, except in so far as their administration can be shown to be contributory to the permanent advancement of pharmacy. Sentiment which relates exclusively backward is out of place. Forty years' experience should have taught us something, and may have untaught us some pardonable preconceptions in which it would be culpable to persevere. But whatever has come down to us unaltered through that long array of years brings with it the impress of permanence, and should not be lightly cast aside. It is in behalf of the future interests and permanent credit of pharmacy that the loyalty of pharmacists must be appealed to, to put an end to a vicious anomaly hostile to the welfare and dignity of pharmacy, and to place it in a position as favourable as that which pharmacy has long occupied in other countries which are not more advanced in the arts and resources of civilization than our own. It may be that some surrender of distinctions, laudably earned and honestly prized, must be the cost of this great gain. Happily that sacrifice will be claimed of those from whom the greatest liberality of sentiment and the clearest foresight may be expected, who will not too critically weigh an individual privilege against a collective advantage, and who will respond with the same alacrity as they did on a former occasion to a similar appeal when the equivalent was less attractive.

Has this Bill the sanction of a long and unbroken approval? Is it any better than those that have gone before? These questions involve a review of the past history of pharmacy, and as there is no such history outside the annals of the Pharmaceutical Society, we must be content to go to that source for our facts.

In 1841, preliminary to the formation of the Pharmaceutical Society, the following resolution was adopted by a representative committee of chemists and druggists, viz.:—"That the objects of the Society be (1) to benefit the public, and (2) elevate the profession of pharmacy by furnishing the means of proper instruction; (3) to protect the collective and individual interests and privileges of its members in the event of any hostile attack in Parliament or otherwise; (4) to establish a club for the relief of decayed or distressed members." The Society was founded upon this basis in the same year, and received its first recognition in the form of a Royal Charter of Incorporation in 1843.

The Charter defined its constitution and objects strictly in accordance with the resolution just quoted. In 1852, the Society obtained its first Act of Parliament, which, besides confirming the Charter generally, created a privileged class of registered pharmaceutical chemists who were declared in the preamble to be needful for the safety of the public, but were not endowed with any exclusive rights beyond that of using the name and title of pharmaceutical chemists, so that, as Professor Attfield well said in his address to the Pharmaceutical Conference, the Act of Parliament declared it to be necessary that pharmacists should be qualified, but did not prohibit unqualified persons from acting as pharmacists. Although this Act was passed on the petition of the Pharmaceutical Society, it did not express the views of its promoters. They had submitted a Bill to restrict the practice of pharmacy to duly qualified men; but Parliament could not then be induced to accept such a radical reform, and the Society wisely took what they could get, well knowing how ineffectual it must prove, but knowing also that it carried with it the important element of legislative recognition which gave the Society a *locus standi* for future operations.

The Society promoted another Bill in 1865, in which it was again proposed (this time in pursuance with a suggestion made to the Government by the Medical Council) to restrict the compounding of the prescriptions of duly qualified medical practitioners to registered pharmacists; but that proposition proved fatal to the Bill.

The next and last Pharmacy Act was passed in 1868;* it created a second grade of pharmacists, to be registered as chemists and druggists, and prohibited all other persons than those registered under the Act from using that title. But its really operative clauses are mere regulations for restricting the sale, etc., of certain poisons scheduled to the Act, clauses which reflect the views of the Government of the day rather than those of the pharmaceutical body. It was important as restricting the selling, retailing, dispensing or compounding of these poisons to the persons registered under the Act, which restriction practically, though not expressly, limited the practice of pharmacy to those persons. The provisions are, however, too incomplete to be satisfactory and are not a sufficient security against interloping, the worst of all forms of competition.

The essential feature of the present Bill is the express restriction of "retailing, dispensing and compounding medical prescriptions," that is to say of the practice of pharmacy, to qualified pharmacists. This is a distinctive characteristic of professional status. The Bill also provides for the ultimate extinction of the secondary grade of registered chemists and druggists, and the consolidation of all who practise pharmacy into one class of "registered pharmaceutical chemists," who alone will be authorized in future to carry on the business of pharmacy. These provisions must have the effect of raising the standard of pharmacy, and the status and estimation of those who practise it.

There are other provisions relating to the sale of "poisonous articles" as distinguished from the "poisons" provided for by the Act of 1868. These provisions are more a matter of police than of pharmaceutical politics.

There are also provisions for placing the sale of patent medicines under the operation of the poisous law, and certain needful powers for the readjustment of examinations. These clauses do not raise important issues, and those which relate to "poisonous articles" have rather been thrust upon than sought by the promoters of the Bill.

Finally, by comparing these historic events with the manifesto of the embryo Society—its promises and its performances—we shall see how far the quality of permanence attaches to the principles so early propounded.

(1). "The benefit to the public," which occupied the post of honour in the resolution, has continued to appear in slightly modified phrase in the preamble of both Acts and in that of the proposed Bill, viz.:—"Whereas it is expedient for the safety of the public." It is important to bear in mind that the public benefit is the only motive that will induce Parliament to legislate in the affairs of any corporation.

(2). "The elevation of the profession of pharmacy by furnishing the means of proper instruction" has been steadily kept in view. A school and lectures were established as speedily as practicable and have been maintained in full efficiency from 1844 to the present time, not without occasional protest by malcontent members. The

* The amending Act of 1869 is a mere supplement to this Act, too unimportant to be enumerated separately.

Society's laboratory has the proud distinction of being the earliest public laboratory for chemical instruction in this country. Examinations were organized and have been expressly sanctioned by the Charter, and by the Acts of 1852 and 1868, and it is intended to make them still more effectual by further provisions inserted in the present Bill. The way in which the Society has fulfilled its pledge to provide suitable pharmaceutical education and has by various facilities encouraged scientific pharmacy is the chief means by which it has established its claim to public respect and confidence, and has acquired an authority which enables it to exercise a beneficial influence upon legislation.

(3). "The protection of the collective and individual interests and privileges of its members in the event of hostile attacks in Parliament or otherwise" has been fulfilled by the prevention of hasty and impractical legislation, and by the defence of individual chemists oppressed by unjust and vexatious prosecutions. This intervention has not been confined to the protection of its own members, but has been exercised in a catholic spirit on behalf of chemists who do not belong to the Society or contribute to its funds. In addition to this, whatever privileges or exemptions pharmacists enjoy (what they enjoyed when the resolution was formulated it would be hard to say, except the privilege of being let alone) have been secured to them by the vigilance of the Society. Nor will it escape observation that the new Bill aims a more direct blow at unlicensed competition than it has hitherto been possible to deliver.

(4). "The establishment of a club for the relief of decayed or distressed members" has been more than realized by the foundation and consolidation of the Benevolent Fund, which distributes its charity over a wider area than was originally contemplated, under powers introduced into the Act of 1868.

It seems, therefore, that nothing remains to be done of the objects proposed by the founders of the Society, nor so far as I know anything else which has ever been generally accepted by the pharmaceutical body, with the one serious exception of restricting the practice of pharmacy to those whom the law has required to qualify themselves for it. Powers to this effect were sought for in the first application to Parliament in 1852. The application was renewed in 1865, it was unwillingly abandoned after much deliberation in 1868, as being then impracticable, and it now forms the salient feature of the Bill of 1883. Nor has the Society voluntarily introduced new objects which are not fairly accessory to the old,—the poisons clauses, as already stated, having been originated in a quarter too powerful to be resisted.

I submit that the restriction of the practice of pharmacy to qualified pharmacists is a principle which comprehends the whole *raison d'être* of the Pharmaceutical Society, that it is the kernel of the policy which its founders and their successors have been labouring to consolidate for the last forty years, and that, in virtue of these qualities, it demands and deserves the loyal support of all classes of the pharmaceutical body, whether associated with the Society or not. If they give that support cordially and unanimously it is my hope and belief that the present effort will be successful; but if there is a large amount of schism amongst those whom a common interest should unite, it is to be feared that the present favourable opportunity will be lost and that the "elevation of the profession of pharmacy" in England to its rightful position will again be indefinitely postponed.

EX-PHARMACIST.

John Laurie, W. T. Hicks, Associate, Minor Associate in Business and Excelsior.—We believe that in the event of the Bill passing into law it is intended by the Council to propose a bye-law admitting "Minors" to the examination enforced after 1887 under the same regulations as are now in force, and in that way all ground for the objections you raise would be removed.

Henry Long.—We appreciate your remarks on the mischief produced by want of union in the pharmaceutical body on previous occasions, and think you cannot do better than act in the spirit of your remarks by giving the Council credit for having taken into consideration the various points you refer to.

R. Martin.—We do not think that in the present day there is any ground for hoping that the Legislature would entertain proposals for creating an exclusive monopoly, even in the trade in drugs, or that it would consider such a measure desirable for protecting the interests of the public.

One who loves the work but not the pay.—It does not appear to be feasible to attempt to prohibit the establishment of branch shops, though it is eminently necessary to establish regulations as to the mode in which they are carried on.

Local Secretary.—Lozenges and other medicines must contain a deadly dose of poison to bring them within the provisions as to labelling.

Hospital Dispenser.—The class that you refer to is outside the limits of pharmaceutical legislation.

Asinus post prand.—The proposed Pharmacy Bill would not give grocers and others any right other than they now possess of selling the articles you mention; but it provides that they shall not continue to do so without observing certain formalities deemed to be necessary in the interests of the public.

J. Thompson.—With regard to your first two questions, we can only suggest that it has been deemed desirable in the interests of the body to adopt the provisions referred to. With regard to the other point we do not think there is any probability of the Legislature entertaining a proposal to prohibit the sale of patent medicines by tradesmen who are not pharmacists.

E. E. c. R. R.—If you refer to the Bill you will see that it does propose to restrict dispensing in the way you think desirable.

W. T. Hicks.—We fail to perceive any such inconsistency as you suggest. The sale of one article you mention by a grocer or an oilman is illegal, the sale of the other is not, and the provisions of the Bill with regard to the sale of the latter are simply a limitation of existing rights.

J. C. Meacher, Devoniensis and J. D.—These three correspondents, who write to point out the hardships that would be inflicted upon unqualified managers of branch shops, if clause 8 of the Pharmacy Bill were to become law, are reminded that such persons ought to have no great difficulty in acquiring a right to registration by passing the Modified examination, unless they have ignored the provision made in their behalf in the Pharmacy Act, 1868.

A. P. S. (Eng.).—Thanks for your letter, and the information it contains, which we will take care shall be brought under the notice of those whose conduct you approve.

A. B. C.—(1) Syrupus violæ, P.L.: Fresh petals of *Viola odorata*, ℥ix.; boiling distilled water, Oj.; macerate for twelve hours, express and strain. Let the dregs subside and dissolve in the clear liquor by the aid of a gentle heat twice its weight of sugar; when the syrup has cooled add f℥ss. of rectified spirit to each f℥j. of syrup. (2) See papers on pill coating in vol. iv., p. 953, vol. viii., p. 461, and many other places.

T. H. North.—The formula for the preparation mentioned has not been published.

A Student.—Tomes's 'System of Dental Surgery,' published by J. and A. Churchill.

J. H. D.—*Liquor Potassæ Brandishii*: American pearl ashes, lb. vj.; wood ashes (from ash wood), lb. ij.; quicklime, lb. ij.; boiling water, cong. vj. Add first the lime, then the pearl ashes, and afterwards the wood ashes to the boiling water; mix together; let the mixture stand for twenty-four hours, and then decant the clear liquor. (Gray's Supplement).

Gulielmus.—For information as to "starch glaze preparations," see before, p. 439, and vol. xii., p. 318.

T. C. J. Mathews.—The subject has been already discussed in the Journal. See vol. xi., pp. 148, 168, 208, 248.

Quærens.—Mr. B. Squire's "Glycerole of Bismuth" is a solution of nitrate of bismuth in glycerine. See *Pharm. Journ.*, [3,], vol. vii., pp. 389, 470, etc.

COMMUNICATIONS, LETTERS, etc., have been received from Messrs. Turnbull, North, Ferguson, Hay, Newsholme, Millhouse, Herbert, J. R.

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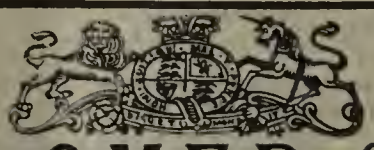

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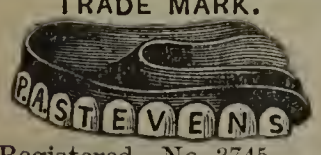

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Director : Dr. JOHN MUTER, M.A., F.I.C., F.C.S., &c.

FOURTEENTH SESSION, 1882-3.

Every bench in the Pharmaceutical Laboratories is engaged up to the April Examinations, and more than half until July. For the remaining places, Syllabus, &c., pply to W. BAXTER, Secretary.

ENGAGEMENTS WANTED.

LOCUM TENENS.—Mr. W. B. WEST, Staines Rd., Hounslow. 30 years' town and country experience, and unexceptionable references as Temporary Manager extending over the last 12 years.

MANAGER or ASSISTANT.—A gentleman of extensive experience in town and country businesses requires a situation. Age 34. Married. R., 9, Stafford Pl., Buckingham Gate, London.

A SAXON, highly recommended, age 25, height 5ft. 10in., speaks French and English, can aid in a Surgery, seeks place as ASSISTANT, for April 1st. Full particulars, care of Mr. Poths, Sugarloaf Ct., Leadenhall St., or C. REHM, English Chemist, Lausanne.

APPRENTICE to a Manufacturing or Pharmaceutical Chemist. In Midland or North Midland principal town preferred. For 3 years. A youth in his 17th year. Has had a superior education, and passed his Oxford Junior examination. Has strong taste for chemistry. Height 6ft. Moderate premium. Write, with particulars and terms, to W., Advertiser Office, Buxton.

AS Junior ASSISTANT. Age 20½. Height 5ft. 11in. Good reference. In or out-door. Would prefer time for study. T. G., 8, Brondesbury Ter., Kilburn, N.W.

AS ASSISTANT. In-door. London. Time to attend lectures. 3 years' first-class experience. Can Extract Teeth. Age 21. Height 5ft. 10in. Good references. Passed Prelim. A. E. D., 23, Green Croft Ter., Salisbury, Wilts.

INDIA.—A gentleman going to India shortly is desirous of obtaining a good situation as Chemist's ASSISTANT, or DISPENSER to a firm of Surgeons. 12 years' thorough experience in first-class establishments. Good Dispenser. Can produce highest references as to character and ability. Age 27. Married. No family. State salary given, and hours of business, to CHEMIST, care of Mr. White, 105, Boutport St., Barnstaple, Devon, England.

AS ASSISTANT, by a young man, where time for study will be allowed. Salary in proportion to time given. Age 24. Satisfactory references. H. ELWICK, 91, Gooch St., Birmingham.

AS JUNIOR or IMPROVER. Age 25. First Class, London Matriculation. Good references. Disengaged March 1st. A. E. E., 8, Bennett St., Bath.

AS JUNIOR or IMPROVER. Height 5ft. 9in. Age 18. 2 years' experience in good West-end business. Time would be given for 3 months. L. A. W., Prospect House, Hanxwell.

AS JUNIOR or IMPROVER. In-door. 3 years' experience, with good references. Age 19½. Disengaged. London preferred. P. TUCKER, care of Mr. G. Cooper, 33, St. David's Hill, Exeter.

AS JUNIOR. 4½ years' experience. Height 5ft. 4½in. Age 20. Disengaged. London or South preferred. W. H. JAGO, 14, Wolsley Ter., Mutley, Plymouth.

JUNIOR ASSISTANT. For town, country, or abroad. Willing and obliging. Age 21. Height 5ft. 7in. Excellent references. Passed Preliminary. 5 years' all round experience. J. SCOTT, Davies & Co., 19, Craven St., Strand.

TO APPRENTICE a youth, aged 15, to a good Retail and Dispensing business. London or neighbourhood preferred. B. L., 248, Kentish Town Rd.

AS JUNIOR in Retail and Dispensing. Good experience and references. Age 21½. Height 5ft. 8in. Disengaged shortly. F. W. B., 25, Friargate, Derby.

MANAGER or SENIOR. Married. Age 30. Minor qualification. Registered Dentist. Town and country experience. A permanency required. K., 5, West Pl., Fareham.

AS ASSISTANT. In London. Good experience and highest references. With time for study preferred. SECUNDUS, 226, Marylebone Rd., London.

ENGAGEMENTS WANTED.

AS JUNIOR. Nearly 4 years' experience. Age nearly 19. Height 5ft. 4in. Unexceptionable references. Disengaged shortly. ALPHA, Baldwin House, Fratton Rd., Portsmouth.

AS ASSISTANT or JUNIOR. In a good class Retail and Dispensing business. Midland counties preferred Can Extract Teeth. Ætat. 21. CHEMICUS, 17, Broad Gate, Coventry.

WHOLESALE.—TRAVELLER with good connection seeks re-engagement, or as MANAGING FOREMAN, or other position of trust. Highest references. 8 years' experience. A. F. C., 69, Wright St., Hull.

AS JUNIOR in a Dispensing business in London. Age 20½. 4½ years' experience. Disengaged. X. Y. Z., Mr. Harding, 59, Dunlace Rd., Clapton Park, E.

AS ASSISTANT in a Dispensing business. Age 25. 9 years' experience. Disengaged March 5. CHEMIST, 1, Newton St., High Holborn, W.C.

EVENING employment. Can give a day when required. Well up in all branches. Good references. E., 61, Parkholme Rd., Dalston Lane, Dalston Junction.

AS ASSISTANT. In or near London. With three hours daily for study. Age 25. Qualified, with excellent references. Liberal terms for a comfortable home. Please state particulars. ALPHA, 1, Brighton Rd., The Avenue, Southampton.

AS JUNIOR. 6½ years' experience in first-class Retail and Dispensing business. Age 25. Height 5ft. 9in. Churchman. W. R., Livingstone Temperance Hotel, King's St., Sheffield.

AS JUNIOR or IMPROVER in a good business. Neighbourhood of Bradford or Leeds preferred. Age 18½. 3 years' experience. F. M., Dr. March, Tennyson Pl., Bradford, Yorkshire.

MANAGER of Branch or SENIOR. Age 35. Registered. Quick and accurate Dispenser, good Prescriber, active Counterman. Very satisfactory references. Now disengaged. Town or country. H. G., 31, Russell St., Mile End Rd., London, E.

AS MANAGER or SENIOR DISPENSER. Out of doors. Married. Registered Chemist. West-end experience. Highest references. L., Mr. James, Chemist, 85, Highgate Rd.

A GENTLEMAN of long experience and good address, Pharmaceutical Chemist, desires to take charge for long or short period. Highest references. ALPHA, 3, Blomfield Ter., Paddington.

EVENING engagement as DISPENSER to a Surgeon or in a good Dispensing place. Disengaged after 5 p.m. J. T., 43, Margaret St., Amwell St., E.C.

IN London. Where a short time daily could be arranged for lectures. Age 27. Minor qualification. Height 5ft. 10½in. Disengaged. A. M., 177, Regent St., W.

LOCUM TENENS, or Temporary ASSISTANT, by a Registered Chemist. Middle aged. Well experienced, with good references. S., 6, Manchester St., Kings Cross, W.C.

MANAGER of Retail. Registered. Long experience. London or suburbs. Middle age. Married. Present and past reference. Disengaged March 5th. YEATMAN, 15, Crowndale Rd., Camden Town, N.W.

BY Minor man with extensive experience. Age 22. London preferred. Now disengaged. Please state salary, &c., to H. J. S., 2, Milton Villas, London Rd., Newbury.

JUNIOR or IMPROVER. London, South East, or East Coast preferred. Age 20½. Height 5ft. 3in. 4 years' good experience. Disengaged. F. B. I., 68, Buchan Ter., Brinton's Rd., Southampton.

ENGAGEMENTS WANTED.

A STUDENT wishes to meet with a situation as ASSISTANT during part of the day. The time can be arranged. Age 22. H. S., 36, Gower Pl., W.C.

AS ASSISTANT. 12 years' good experience, London and country. Age 26. Salary and references on application. A. W. D., 58, Gibson Sq., Upper St., Islington, N.

AS JUNIOR in good business. Town or country. Aged 20. Height 5ft. 10in. Good references. T. J., 41, Trinity St., Islington, N.

TO improve knowledge of Dispensing and Retail Would pay part board. Age 27. London or suburbs. Good references. C. L., 100, Warwick Rd., Kensington.

ASSISTANTS WANTED.

A COMPETENT ASSISTANT. Must be a neat and accurate Dispenser, and well up in the Retail. Age 24 to 30. In-doors. State full particulars and salary required. W. PINYON, Chemist, 49, Abbey Rd., St. John's Wood, N.W.

A JUNIOR ASSISTANT or IMPROVER In-doors. Comfortable home. Time allowed for study. Apply, stating salary required, and usual particulars, to T. BAILEY, Chemist, Coventry.

TO Parents and Guardians.—An old-established Chemist and Druggist has a vacancy for a respectable well-educated youth as APPRENTICE. Address, 5, Burgess, Coventry. Time allowed for study. Premium required.

A WORKING Laboratory man. Thoroughly acquainted with the Manufacture of Soluble Essences. Apply by letter to W. L. 887, Messrs. Deacon's, Leadenhall St., E.C.

FOR India.—Chemist's ASSISTANT. Age about 22. Must have passed Minor examination. Address, QUININE, care of Messrs. G. Street & Co., 30, Cornhill, E.C.

A CHEMIST'S ASSISTANT (from London), to take charge of the Medical Department of a Trading Company in India. Age 20 to 24. Must be proficient in preparing Prescriptions, and have a general knowledge of drugs. Salary, first year 100 rupees per month, second year 125 rupees, and third year 150 rupees per month, with unfurnished lodging. Passage paid out. Apply by letter only to E. G. R., 1, Gt. Winchester St., E.C. No reply sent if application not entertained.

A QUALIFIED ASSISTANT, for a large Dispensing establishment in North-West India. A single young man, a member of a Nonconformist church, will be preferred. Apply by letter only for further particulars, and stating qualifications, to JOHN HADDON & Co., 3, Bouverie St., Fleet St., London.

AN ASSISTANT. Not under 26 years of age. Minor preferred. Must be active and obliging. Good references indispensable. In-door. Apply, stating age, height, salary, &c., and if able to Extract Teeth. Enclose carte to CHARLES AMOORE, Castle St., Hastings.

AN ASSISTANT, who has been accustomed to a first-class Family business. Must be an accurate Dispenser, and of gentlemanly appearance and address. Apply, stating age, height, and salary required, C. M., Athenæum, George St., Sheffield.

DISPENSER, by a medical man in Kent, to attend to his private surgery and Dispense. Lodgings and attendance provided. Address, stating terms, to Dr. ARROL, Sheerness.

IMPROVER or APPRENTICE, with good class Chemist. In-doors. Youth 17. Genteel. Good penman. Steady. Passed Preliminary examination. 12 months' experience. Terms and particulars to JOHN BARKER, Stationer, Ashby-de-la-Zouch.

ASSISTANTS WANTED.

AN ASSISTANT, in-doors, for a Surgeon's Retail. Should be a quick and accurate Dispenser. Apply personally. to 19, Eccleston St., Pimlico.

MESSRS. DAVIES & HILLIER, 15, Old Bond St., Bath, require by the 19th March the services of a Dispenser, age about 23. Minor qualification. Applicants by letter to state height, and enclose carte de visite. Salary progressive. One seeking permanency preferred.

THE end of March.—A steady, active JUNIOR or IMPROVER, with good references, for a Mixed country trade. A Christian young man, Dissenter. Small salary first 6 months. Apply, with full particulars in first letter, salary required, age, height, &c., and carte, to WILLIAMS, Chemist, Coleford, Gloucestershire.

FOR a London suburb.—An ASSISTANT, not under 23, of gentlemanly appearance and address, with Minor qualification and good business experience. Highest reference required. One seeking a permanency preferred. Apply, personally or by letter, to W. W. FLOOD & Co., 102, Blackman St., Boro'.

SECOND COUNTERMAN for quick Retail Drug Trade. Salary 30s. Out-door. No Sunday work. Activity, experience and first-class references indispensable. State age and full particulars to W. L., 107, Fleet St., E.C.

A JUNIOR, out-door, who wishes to fill up his time, when not attending lectures, &c., from about 2.30 to 8 p.m. Apply by letter, stating particulars, to T. H., 12, Canonbury Pl., Islington, N.

THE General Apothecaries' Co. require a competent out-door ASSISTANT for their City branch. Apply to Mr. J. J. PIERCE, 27, Bishopsgate St. Within.

A CHEMIST in London has a vacancy for a Dispensing ASSISTANT. Time given to attend lectures, &c., at Bloomsbury Square. Address, with full particulars, to A. L., care of Messrs. Flood & Co., Wholesale Druggists, 102, Blackman St., London, S.E.

AN energetic qualified ASSISTANT. Not under 24 years. Must have a good knowledge of his profession, have good references as to conduct, be able to Extract Teeth, and to fit up Sea Medicine Chests. State height, salary, and send photograph to R. J. J. MAYS & SON, 3, Market Pl., South Shields.

APPRENTICE.—By a Pharmaceutical Chemist in the West of London, a well educated youth as a PUPIL. Together with Dispensing and the usual Retail, he will have the advantage of a practical acquaintance with the details of a Pharmaceutical laboratory. Facilities will be afforded for his attendance in the usual Courses of Lectures. Address, A. B., care of Mr. Bremridge, 17, Bloomsbury Sq., W.C.

A JUNIOR ASSISTANT, about 22 years of age, who can be well recommended. Apply personally, or if by letter, state age, experience and salary expected. M., 346, Essex Rd., London.

ON the 19th March.—Out-doors. Age about 25. A trustworthy ASSISTANT (single) for Mixed business. Capable of Prescribing and Extracting Teeth, of thorough business habits, and a good Salesman. Good references indispensable. Applications not answered in two days declined. Apply J. WOOD, Chemist, Bridgehouses, Sheffield.

A JUNIOR ASSISTANT. In-doors. He would be required to attend to Post Office duties. A quick clear-headed young man. Character indispensable. An abstainer preferred, who could Extract Teeth. State age, salary required, and give references, to JOHN GIBSON, Chemist, Chapeltown, near Sheffield.

MR. J. ROBERTS, 1, New Bridge St., and 97, Clayton St., Newcastle-on-Tyne, has now a vacancy for a first-class JUNIOR.

ASSISTANTS WANTED.

A JUNIOR ASSISTANT. In-door. With good address, and able to Dispense. Apply, with usual particulars, to E. BENNETT, High St., Ledbury.

EDWARD W. WAITES, Pharmaceutical Chemist, Tredegar, is in want of a Junior ASSISTANT. State age, salary required, and references.

AN ASSISTANT for a light Retail and Dispensing business. Not under 22. Must be well recommended. Minor qualification desirable, but not indispensable. Full particulars, with carte (to be returned), to W. H. DAVISON, Chemist, High St., Hastings.

IMMEDIATELY.—A Junior ASSISTANT. Good address and able to Dispense. Apply, enclosing carte de visite, and stating age, height, experience, salary required, and references, to W. E. STOKES, Chemist, Brompton, Kent.

A GENTLEMAN, in a good Retail and Dispensing business, as IMPROVER. Ample time for study in lieu of salary. Comfortable home. Apply KILO, care of Messrs. Wright, Layman and Umney, 50, Southwark St., Boro', London.

JUNIOR.—Out-door. Where two are kept. Must be a good and quick Dispenser, with satisfactory reference. Apply, with statement of salary required, height, &c., and enclose carte if possible, to GEO. WATERALL & SON, Chemists and Opticians, Nottingham.

AN out-door ASSISTANT. Must be well up in Dispensing and a good Counter hand. Apply, with full references, enclosing carte de visite and stating salary required, to GOULDINGS, Cork.

AT once.—An ASSISTANT to take charge of a Branch. Able to Extract Teeth. Unmarried. Age under 30. Apply by letter in the first instance, enclosing photo., to be returned. J. W. ANDREWS, High St., Croydon.

AS Second ASSISTANT. Accustomed to good Family and Dispensing trade, and with satisfactory references as to character and ability. Salary £40. Apply, with full particulars and carte enclosed, to G. SPEECHLY, Bishop Stortford.

BY end of March.—An in-door ASSISTANT, seeking a permanency. With Minor qualification preferred. Must be well up in Dispensing and good class Counter work. Liberal salary. Must be able to produce satisfactory references. Apply by letter, with usual particulars, to N., Evans, Lescher & Webb, 60, Bartholomew Close, E.C.

AN ASSISTANT. Age about 22. Accustomed to first-class Retail and Dispensing. Apply, R. HISCOCK, Coventry.

AN APPRENTICE, who has passed the Preliminary or its equivalent. In a first-class Dispensing and Family business (old established) in the Western suburbs of London, where there are unusual opportunities of acquiring a superior knowledge of the business. Address, PHARMACIST, care of Messrs. A. S. Hill & Sons, 101 and 103, Southwark St., S.E.

AT once.—A Junior ASSISTANT, about 22 years of age, for the Mixed trade. Must be able to Extract Teeth. Hours 8 a.m. to 8 p.m. No Sunday duty. Must have had some experience in the Mixed trade. Address, stating salary required, when at liberty, and references from two last situations. J. WATTS, Chemist, Attercliffe, Sheffield.

A JUNIOR ASSISTANT or IMPROVER. Apply, stating salary required and usual particulars, to J. H. ADAMS & Co., Stoke-upon-Trent.

JUNIOR ASSISTANT. Minor qualification necessary. Must be of good appearance. State age, salary required, and usual particulars (letters not answered within a week declined), to Mr. I. JAMES, care of Messrs. Orridge & Co., 32, Ludgate Hill, E.C.

ASSISTANTS WANTED.

SENIOR Assistant, for a permanency, in the West-end. 4 kept. Address, stating experience, age, salary, &c., to A. B., care of Barron, Squire & Co., Bush Lane, Cannon St., E.C.

ASSISTANT. Immediately. Either whole or part time. To take sole charge of Retail during part of the day. Must be experienced, and have good references. Out-door. Apply to J. S. Ashmead, 46, All Saints Rd., Westbourne Park, W.

AN experienced Assistant, to take the management of the Dry Room in a Wholesale Drug Warehouse. Also Junior Assistant for Patent Medicine Department. Apply, Lofthouse & Saltmer, Hull.

IMMEDIATELY.—A gentlemanly Assistant, of good address and business habits, for a good class country business. Must be a quick and accurate Dispenser. 1 only kept. A permanency offered. Apply, stating references and salary required, age and height, to W. Banbury, The Pharmacy, Dursley.

BUSINESSES FOR DISPOSAL.

MANCHESTER.—To be sold, freehold shop, house and premises, which carries with them the goodwill of one of the oldest Businesses in the centre of the town. Excellent opening for druggist who can practice Dentistry and Prescribe. Price £5000, of which £3500 may remain on mortgage. Early possession can be given. Application by principals or their solicitors only to Withington, Petty & Boutflower, Solicitors, Spring Gardens, Manchester.

SOUTH Wales.—In consequence of the failing health of the Proprietor. One of the oldest and largest Drug and Sundries Business in Cardiff. Doing at present an extensive wholesale and retail trade, and capable of being considerably increased in the hands of an energetic man. Apply to Watkin J. Thomas, Chemist, Aberdare, Glamorganshire.

CORNER Business in main thoroughfare. Populous neighbourhood. Established 27 years. Returns last year over £500. Can be bought for £300, or less to an immediate cash purchaser. Excellent house. Rent and taxes covered. Owner taking larger business. Full particulars on application to Ellsum, Chemist, Manchester, N.W.

THE advertiser having a wish to retire, in consequence of ill-health, desires to meet with a qualified Assistant for the end of April or sooner, with a view to succession in two or three years, or earlier. The business is large and very old established Dispensing, Prescribing, General and Retail, with a large proportion of Horse and Cattle medicines; and none need reply who are not thoroughly experienced in all these branches, as well as being a clever counterman. Character also must bear the strictest investigation, and to save time and trouble, applicants will please state the usual full particulars. Address Country Chemist, Messrs Evans, Lescher & Webb, 60, Bartholomew Close, London, E.C. Letters not answered in a week, declined.

A DISPENSING and light Retail Business (a branch). Situated in a beautiful and extensive agricultural district in the North of England. A nice little trade done in seeds, sheep dipping, and general farmers' requirements. No opposition and full prices for everything. To any one accustomed to a country trade this would be a perfectly safe venture. Average takings £9 per week, which there is no question could be increased if superintended by the proprietor. Rent and rates very low. Position of premises best in the place. Lowest price £320. The shop is well stocked and neatly fitted up. Apply to H. C. Mason, 1 & 2, Australian Avenue, London.

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MESSRS. GURDEN BERDOE have for transfer :— Oxfordshire. A thoroughly genuine Dispensing and Retail Trade. Returning £460. Full prices. Large house. Taken larger trade. Must sell. Strictly genuine reliable Business. Lancs. Unopposed Retail Agricultural Trade. Returning £14 weekly by manager. Rent £20. Good house. Only £250. Sheffield. Returning £800. Retail and Prescribing Trade. Owner taken larger place must sell. Only £350. West Coast. Retail and Prescribing Trade. Returning £475. For £275. Owner going into Dentistry. West of England. Retail and Dispensing Trade. Returning £1200. Handsomely fitted. Full prices. Rent £35. Good house. Garden. £1000. London. Handsome corner Retail and Family Trade. Showing nearly £400 net profit. For £875. Strictly genuine. Every scrutiny allowed. S.W. Delightfully situated. Well fitted corner. Returning £750. Open to offer. N.W. Corner Retail and Dispensing Trade. Showing £300 net profit. For £450. N. Retail and Prescribing Trade. Returning £450, by manager. Only £250. Another. Returning £4 to £5 weekly. For £135. Fittings and stock worth the money. Please apply, 30, Jewry S , Aldgate, City.

IMMEDIATELY.—Death vacancy. A retail Chemist and Druggist Business. Established over 50 years in the North Western District, at a commanding corner of four thoroughfares. Rent 60 guineas per annum. Lease 11 years to run. Takings, £300 per annum. Apply to T. T., Arthur S. Hill & Son, 101, Southwark St., S.E.

SOUTH Devon.—Through ill-health. An old established light Retail, Dispensing and Prescribing Business. Returns between £500 and £600. Net profits £230. Price £400, including part of furniture. Address, S. 100, New St., Birmingham.

MR. HINE GILBERT has for disposal at West-end. Well-established and increasing Business. Returning £1300 annually. No immediate opposition. Also. In healthy suburb, a rising Business. Showing £300 per annum net profit. Full particulars of these and others within easy distance of town and by the sea, to be obtained at 17, Hart St., Bloomsbury Sq.

SURREY.—Pleasant and healthy part, within 10 miles of London. On account of ill-health. A bonâ fide Business, with Post Office attached. Immediately. Rent £40 per annum. Small house and garden. 16 years of lease to run. Apply to Mr. Barrett, Post Office, South Norwood, S.E.

LIGHT Retail and Dispensing, with small Fancy Goods and Stationery. In fashionable watering-place on the Welsh Coast (south). No opposition within 9 miles. Returns last year, £450, at full prices. Price about £350. Rent £12. With garden, &c. Further particulars, Wales, Messrs. Evans & Lescher, Bartholomew Close, E.C.

OXFORD.—A thoroughly genuine middle-class light Retail and Dispensing Business. No heavy trade. Nearly all cash. Will bear fullest investigation. Large house. Private entrance. Rent could be let off. Owner taken larger business. Price £450. Turpin, Clarendon St., Oxford.

GOOD Family and Prescribing Business. In best position. Market town, West Norfolk. Returning £1400 per annum. Without oils or heavy trade of any kind. Good shop, well fitted in mahogany, on long lease. Rent £35 per annum. Price £800, all at. Address, M. P. S., Messrs. J. Sanger & Son, 489, Oxford St., W.

A BARGAIN.—£150 will purchase old-established Dispensing Business. In one of the best districts of Bristol (virtually Clifton). First-class fittings alone worth double above amount. Apply, first by letter, either to T. Milton, Sen., Postmaster, Chew Magna, Bristol, or J. S. Milton, 451, Cold Harbour Lane, London, S.W.

BUSINESSES FOR DISPOSAL.

IMMEDIATE.—£250. Cash. South of England. Good chance for beginner. Address, NINE, care of Messrs. Davy, Yates & Routledge, 64, Park St., Southwark.

ST. HELIERS, Jersey.—Immediately. Prescribing, light Retail and DISPENSING. In centre of main business street. Elegantly fitted shop. Glasgow patent recess-labelled bottles, glass labelled and knobbed drawers. Well stocked. Satisfactory reasons for disposal. For particulars, address T. PARSONSON, Chemist, Jersey. N.B.—Qualification not necessary.

IMMEDIATELY.—An old established ready-money BUSINESS. Mixed trade. North Staffs. Central position. Satisfactory reason for disposal. Apply, 400, Messrs, Barron, Harveys & Co., Giltspur St., E.C.

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CAMBRIDGE.—HOUSE and SHOP, suitable for a Chemist. In a main road in a densely populated neighbourhood. No chemist near. Rent and taxes £16. Apply to H. D. BENTON, 51, Ferntower Rd., London, N.

VENTNOR, I.W.—With immediate possession. Superior premises. In a commanding position in the High Street. Recently occupied by a chemist. The premises were specially built for the business. The shop is elegant and the fittings are of the very best description. The house is commodious and convenient, with garden at the rear. Will be let with option of purchase of lease. 16 years to run. Fittings may be taken at valuation or treated as fixtures. Particulars on application to CHAS. MITCHELL, Estate Agent, Ventnor, I.W.

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FRESENIUS' ANALYSIS. 2 vols. Price 20*s*. F. A., Pratt Bros., 12, Connaught St., Hyde Park, W.

FOR SALE CHEAP.

STOCK and Fittings of a Chemist's Shop: Drawers, Bottles, Carboys, Cabinets, Lamp, &c., complete, and sufficient for a small shop. Very suitable for a beginner. LINDEN, Broughton, Winchester.

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CAN have their Mechanical Work well done, and Advice given on Cases, by applying to a fully qualified Dentist.

Address, W. J., care of Messrs. Rutterford, Poland Street, Oxford Street, W.

WYE HOUSE ASYLUM, Buxton, Derbyshire, for the Middle and Upper Classes of BOTH SEXES, is beautifully situated in the healthy and bracing climate of the Derbyshire Hills, and is directly accessible by the Midland and London and North Western Railways. For terms and other particulars, address the Resident Physician and Proprietor, Dr. F. K. DICKSON.

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Of Messrs. SMITH & SONS,

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The Pharmaceutical Journal AND Transactions.

THIRD SERIES, No. 663.] SATURDAY, MARCH 10, 1883. [PRICE FOURPENCE.

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EVENING MEETING.

The next EVENING MEETING will be held on Wednesday, April 4th, 1883, at Eight o'clock.

The Chair will be taken at half-past Eight *precisely*.

Papers intended to be read at that Meeting should be forwarded to the Secretary not later than Wednesday, March 28th, as papers received after that date cannot be announced in the *Pharmaceutical Journal* previous to the Meeting.

ELECTION OF COUNCIL AND AUDITORS.

EXTRACT FROM THE BYE-LAWS.

SECTION 5, CLAUSE 3.—"Any person qualified to vote desirous of nominating any Member for election as a Member of the Council or as an Auditor, shall give notice in writing, with the name and address of the nominee, and, if for the Council, disclosing whether such nominee be or not a Pharmaceutical Chemist, to the Secretary of the Society, *on or before the 24th day of March*, in every year; and the Secretary shall, on or before the 26th day of March then instant, address and send by post to each nominee a notice of his having been so nominated, and inquiring whether he will accept office if elected, and in default of a written reply from such nominee, declaring his readiness to accept office, if elected, being received on or before the 31st day of March then instant, such nominee shall not be deemed eligible or willing to be elected."

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MAJOR, MINOR AND MODIFIED EXAMINATIONS.

The Board of Examiners for England and Wales meets at 17, Bloomsbury Square, London, in February, April, June, July, October, and December, and the Board of Examiners for Scotland meets at 119A, George Street, Edinburgh, in January, April, July, and October, for the purpose of conducting the above Examinations. Candidates must give notice to the Registrar in London, and pay the fee on or before the *first* day of the month in which the Examinations are held. Each candidate for the Major and Minor Examinations must, at the time of giving notice, produce a Registrar's Certificate of Birth, and a certified declaration that for three years he has been registered and employed as an Apprentice or Student, or has otherwise for three years been practically engaged in the translating and dispensing of prescriptions. Printed forms of declaration may be obtained from the Registrar in London. Each Candidate for the Modified Examination must state the number of the receipt for his declaration and his age at the time of giving notice.

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* A Certificate of having passed any of the Examinations approved by the Council (a list of which may be obtained from the Registrar) will be accepted in lieu of this Examination, provided Latin, Arithmetic, and English were included in the subjects of the Examination for which the Certificate was granted.

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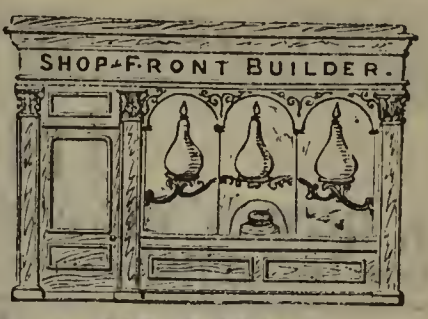

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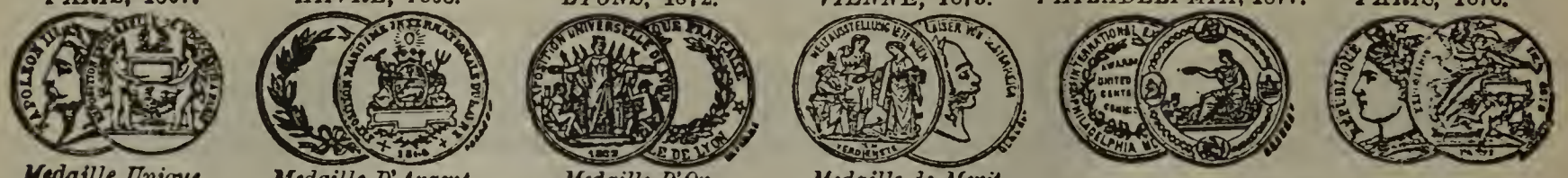

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CHINOQUININE.

The entire precipitated and bleached crystallizable alkaloids of East Indian Red Bark (*Cinchona succirubra*), containing Quinine, Cinchonidine, and Cinchonine in the form of *Muriates*. In appearance, medicinal properties, and mode of administration it closely resembles Quinine; it may be given in all cases where the pure alkaloid is required, whilst, as a tonic, and in cases where Quinine alone is objectionable, its use is especially advantageous.

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A "Scale preparation," containing 25 per cent. of Citrate of Chinoquinine. Dose and medicinal properties are same as Ferri et Quinæ Cit., P. B. In 1 oz. bottles, price 1s. 9d.

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"Pharmacist" Microscope, £4 4s. net; Materia Medica Cabinets, £2 2s. to £4 4s.; Chemical Sets (Minor), 15s; (Major), 25s.

WYLEYS & CO. { WHOLESALE AND EXPORT DRUGGISTS AND MANUFACTURING PHARMACEUTISTS, } **COVENTRY,**

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A POSITIVE CURE FOR STOMACH, LIVER & KIDNEY AFFECTIONS.

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Chemical Analysis of every description promptly conducted.

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SPECIAL TERMS FOR QUANTITIES.

A LIBERAL DISCOUNT FOR CASH.

Ext. Coto. Liq. 2oz. = 1oz. of Bark.
From clinical experiments performed in the General Hospital at Munich, Prof. GIETL concludes that we have in this drug a specific against diarrhœa in its most diverse modifications. Dose, 3 to 5 m. 12*s.* lb.

Opiatine (GALE'S). *Registered.*
The safest and most reliable preparation of Opium, neither causing headache nor constipation. Dose, 10 to 30 m. 8*s.* lb.

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Ess. Secalis Volatilis (GALE'S).
Originated by us over 50 years ago. Much approved and relied upon. Dose, 30 to 50 m. 6*s.* 8*d.* lb.

Tinct. Quebracho.
Much used for the relief of Dyspnœa. Dose, 1 dr. 4*s.* 6*d.* lb.

Liquor Cinchonæ (GALE'S).
1 oz. contains all the Alkaloids of 1 oz. of East Indian Bark. Dose, 15 to 30 m. 10*s.* lb.

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The safest, most reliable, and efficacious preparation of Phosphorus. *Vide* BRITISH MEDICAL JOURNAL, April, 1877. 8*s.* lb.

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(ALSTONIA CONSTRICTA—QUEENSLAND FEVER BARK).
This remedy has almost replaced Quinine in Queensland, in the treatment of Ague and Fevers, and as a general tonic in debility after exhausting diseases.
It is free from many of the disadvantages peculiar to Quinine, and is especially useful in those cases where that drug cannot be taken. Dose, ½ to 2 dr. 4*s.* lb.

Cod Liver Oil Emulsion (GALE'S).
Free from Gums and Alkalies which derange the stomach. Agreeable, easily assimilated. 3*s.* 6*d.* bottle.

Dreadnought Hospital Plaster.
(*Registered*).
Pliable, Adhesive, Antiseptic, Non-irritating. 3 yard rolls, 4*s.*

GALE & CO., 15, BOUVERIE ST., FLEET STREET, E.C.

Priced Catalogue and Formulæ of Pearl Coated Pills, with Notes on New Remedies, on application.

LIEBIG COMPANY'S EXTRACT OF MEAT

The only brand warranted genuine by the late and present Baron Liebig.

CAUTION.—Numerous inferior and low-priced substitutes being in the market with misleading titles, labels and portraits of the late Baron Liebig, purchasers must insist upon having the Liebig Company's Extract of Meat.

N.B.—Genuine ONLY with facsimile of Baron Liebig's Signature, in blue ink, across label.

SPECIAL NOTICE.

MUMFORD'S
PURE CRUSHED LINSEED

IS NOW REDUCED TO **19/-** PER CWT.

(*In smaller quantity, 20/- per cwt.*)

"NOTHING FINER CAN BE OBTAINED." NO OIL EXTRACTED.

STEAM MILLS, FARRINGDON ROAD, E.C.

NOTE SUR UNE SOLUTION OFFICINALE DE PROTOIODURE DE FER.*

Par M. Ivan Obrecht.

(Extrait du *Journal de Pharmacie d'Alsace-Lorraine.*)

Nous avons presque tous sur quelque rayon une solution d'iodure de fer, selon la formule de Dupasquier ou de Jeannel, et nous cherchons à la conserver à l'état de protoiodure au moyen d'une lame de fer ou de pointes de Paris. Ces liquides ont au reste un aspect peu élégant, et il n'est pas toujours agréable de manier en présence du public un flacon contenant de vieux clous.

Le sirop d'iodure de fer de la Pharmacopée germanique peut, à la rigueur, tenir lieu de solution officinale ; mais il jaunit à la longue. Il en est de même des préparations indiquées par les formulaires américains et anglais. *United States Ph.* et *British Ph.* mentionnent l'iodure cristallisé ; *Squire's Companion of B.P.* 1871 donne la formule d'une solution qu'il ne parvient à conserver qu'au moyen d'une lame de fer.

Il existe cependant en Angleterre une solution d'iodure ferreux répondant à toutes les exigences. Fletscher et Stevenson, qui la préparent, n'ont pas publié leur procédé : ils nous apprennent seulement que 34 et demi grains d'iodure sont renfermés dans un drachme fluide de leur liquide, ce qui, en grammes, équivaut à 2gr167 pour 3gr54, en centièmes 61 °/₀. *Ces données sont parfaitement exactes, et je n'ai pu trouver dans le liquide aucune autre substance.*

En ayant recours au procédé recommandé par M. Willm (Dict. Ch. Wurtz, p. 1,424), et en évaporant une solution d'iodure de fer dans un courant d'hydrogène, j'ai réussi à obtenir la même concentration que les Anglais, et le produit s'est parfaitement conservé en flacons bouchés pendant quatre mois ; sitôt mis en vidange, il a jauni comme les autres. Celui de Fletscher et Stevenson ne varie pas. Un flacon de 750 grammes, entamé en octobre dernier, renferme encore actuellement environ 125 grammes d'un liquide limpide, d'un beau vert d'eau, dont 29 gouttes, prises au compte-gouttes de Lebaigue, correspondent à 0gr50 d'iodure ferreux, c'est-à-dire la quantité nécessaire pour reproduire 100 grammes de sirop du Codex.

Peut-être quelque confrère s'intéressera-t-il à ce produit et en trouvera-t-il le *modus faciendi.*

---

* Il sera utile de faire observer que nous n'étions en communication, ni directement ni indirectement, avec l'auteur de l'article. Ses remarques au sujet de notre solution d'iodure de fer sont donc entièrement spontanées et volontaires.

Il serait intéressant pour les pharmaciens de comparer les remarques de M. Obrecht avec une "Note sur un échantillon commercial de la solution d'iodure de fer," contribuée par M. B. S. Proctor à la "Brit. Pharm. Conf." en août 1882. La solution examinée par l'auteur contenait, suivant son analyse, de l'acide oxalique, de l'acide phosphorique, de l'acide sulfurique, de l'acide hydrochlorique avec de l'oxalate de fer, et (probablement) de l'acide sulfureux.

En présence de ces rapports, nous ne pouvons assez recommander aux acheteurs "caveat emptor," et d'écarter soigneusement les échantillons commerciaux. Il est à peine nécessaire pour nous d'ajouter que nous garantissons que notre solution d'iodure de fer ne contient pas, et n'a jamais contenu, les préservatifs dont M. Proctor parle.—(F. F. et S.)

FLETCHERS'

Concentrated Liquors.

FLETCHER, FLETCHER & STEVENSON,
Holloway, London, N.

URANIUM OLEATE.*

BY WALTER GIBBONS.

The oleates of the alkalies and those of many other metals are well known to us, but, as far as I have been able to search, an oleate of uranium has not as yet been prepared, nor have I been able to find any mention or suggestion of the same in Watts's Dictionary or similar standard works.

As oleic acid has a great tendency to attach itself to bases, one might expect that it would form a compound with uranium, and I bring this subject before you more with the object of explaining how I have been able to make it in a pure state (by a most simple method) than to claim any particular merit for having been the first to point out, by experiment, that it can be prepared.

The common method of preparing such a compound, would be to make pure barium oleate, add to this the sulphate of the metal, and purify by crystallization from alcohol. This process I found inapplicable in the case of uranium, and therefore tried the following method, with a successful result :—

I prepared pure oleic acid, and to this added in excess uranic oxide (about twice the quantity). This formed a semi-liquid, which, after standing in an atmosphere of hydrogen for twelve hours, solidified. The solid mass, after standing six days, was dissolved in ether and decanted from excess of uranic oxide. The resulting oleate was crystallized from alcohol and dried *in vacuo*.

By this plan a pure oleate was obtained which probably is, like other uranic compounds, an oleate of uranyl (UO_2); thus—

$$UO_2.2C_{18}H_{33}O_2$$

This formula appears to be the correct one from the following figures obtained by combustion :—

	Took of substance.	CO_2 obtained.
(A).	·2046	·385
(B).	·3101	·586
(C).	·3253	·6131

giving an average of ·428 of carbon, the calculated quantity being ·432 for the preceding formula.

The residues from the above three combustions, properly estimated for uranium (see Fresenius's first process), gave respectively the following numbers for uranium :—

Uranium (calculated from oxide obtained)—

(A). ·0582.
(B). ·0885.
(C). ·0931.

Here, again, we have an average of 238, whereas the calculated quantity of uranium is 240.

Taking these two numbers, I think we shall be quite justified in accepting the formula given.

The sp. gr. when freshly prepared is 1·13, but this soon changes owing to the rapid alteration of the compound, which is most unstable. I found that almost immediately on having free access to the air change commenced; therefore it was absolutely necessary for me to keep the compound in an atmosphere of hydrogen. It softens at about 85° C., passing gradually to a liquid of the consistence of treacle, so remaining until a temperature be reached at which it is decomposed.

As yet I know of no medicinal use to which it can be applied; but if in future it be required for outward use, I can recommend it to be prepared by mixing calculated quantities of uranic oxide and oleic acid (using slight excess of the former), and heating on a water-bath for about half to one hour. This will produce a moderately good preparation which should be mixed with some preparation like vaseline or ozokerine to exclude it from oxidizing influences.

[*The discussion on this paper is printed at p.* 752.]

* Read at an Evening Meeting of the Pharmaceutical Society, March 7, 1883.

LIQUID EXTRACT OF CINCHONA,*

WITH DATA ILLUSTRATING THE RESULTS OBTAINED IN ITS PREPARATION BY THE PROCESS OF THE B.P.

BY B. H. PAUL, PH.D.

Some months ago I had occasion to examine a sample of the British Pharmacopœia liquid extract of cinchona and was particularly struck by the fact that it contained only a very small amount of quinine. Provided the liquid extract fully represents the medicinal properties of the bark, as it has had the credit of doing, 35 grains of quinine to the fluid ounce is the proportion that should be present in this preparation when made from bark satisfying the requirements of the Pharmacopœia in regard to percentage of quinine. Instead of this amount, however, I found that in the sample I examined there was less than 2 grains of quinine in the fluid ounce. So great a deviation from what might have been expected in this respect seemed to merit further inquiry, for notwithstanding the fact that the medicinal efficacy of this preparation is not considered to depend exclusively upon the quinine it contains, still quinine is so important a constituent of cinchona bark that it may reasonably be assumed any pharmaceutical preparation claiming to represent this drug ought to contain the quinine as well as the other constituents of the bark from which it is made. I therefore examined several other samples of liquid extract, collected from different sources, and finding that they all agreed in containing but very small proportions of quinine, varying from mere traces up to 2 grains per fluid ounce, I determined to make some further experiments with the object of ascertaining the cause of the deficiency in the amount of quinine. Among the circumstances possibly giving rise to this deficiency there were two which might be anticipated at the outset. First, the well known deterioration in the quality of the "flat calisaya" or yellow bark ordered to be used for the purpose of making liquid extract of cinchona bark by the Pharmacopœia, which has been so great within the last few years that it is now very unusual to meet with a sample of that kind of bark containing anything like the amount of quinine indicated in the Pharmacopœia. Secondly, it has been frequently stated that the process of manufacture ordered in the Pharmacopœia is itself defective, inasmuch as it fails to yield a liquid extract fully representing the medicinal properties of the bark operated upon.

Upon reference to papers in which this subject had been treated of I did not find any precise evidence of the grounds upon which the process of the Pharmacopœia was objected to, beyond general statements of the result of experience, and I therefore determined to put the matter to the test by preparing liquid extract according to the directions of the Pharmacopœia, from bark of known composition, analysing the product obtained as well as

* Read at an Evening Meeting of the Pharmaceutical Society, March 7, 1883.

the residual bark. For this purpose two kinds of bark were operated upon, one an ordinary sample of "flat calisaya," such as is now commonly met with, the other a sample of bark from the Government plantations in India. The following tabular statement of the results thus obtained shows first the amount of alkaloid contained in the bark operated upon, then the calculated proportions of alkaloid which a fluid ounce of the liquid extract made from it ought to contain in order to represent the whole of the medicinal properties of the bark, and lastly, the quantities of alkaloid actually present in the fluid ounce of the product obtained:—

CALISAYA BARK.

1 *lb. containing*—

Quinine	5·50 grains.
Cinchonidine	19·50 „
Cinchonine	101·50 „
Amorphous	21·75 „
	148·25 grains.

Liquid Extract prepared from the above according to the B.P.

Should contain grains per fl. oz.:—		Found grains per fl. oz.:—
Quinine, Cinchonidine, Cinchonine, Amorphous	37·0	8·6
Quinic and cinchotannic acids, etc.		169·6
Total solid contents (Over 10 per cent. of the bark)		178·2

Although the bark here referred to cannot be said to have corresponded with the requirements of the Pharmacopœia, either in the amount of quinine it contained or in being true yellow bark, still the amount of total alkaloid present was quite equal to that indicated in the Pharmacopœia as the proper amount of quinine. But the liquid extract made from it did not contain much more than one-fourth as much total alkaloids as it should have contained if the alkaloids had been perfectly extracted from the bark, and it must therefore be concluded that the deficiency is to a considerable extent due to some defect in the process of preparation as well as to the present inferior character of calisaya bark.

In the case of the Indian bark operated upon in the other experiment, the amount of quinine was nearly as great as the Pharmacopœia requires, while the total alkaloids present amounted to nearly three times as much; but still it will be seen from the following table that even in the liquid extract made from this bark, the proportion of total alkaloids, as well as that of quinine, fell far short of what should have been present if the preparation was to represent the whole of the medicinal properties of the bark, for while a fluid ounce of the liquid extract contained only one-eighth as much quinine as it should do, the total alkaloid did not even equal the half of that quantity, and actually amounted to only one-seventh part of the alkaloid present in the bark used in preparing the extract:—

INDIAN BARK.

1 *lb. containing*—

Quinine	135 grains.
Cinchonidine	134 „
Cinchonine	84 „
Amorphous	44 „
	397 „

Liquid Extract prepared from the above according to the B.P.

Should contain grains per fl. oz.:—			Found grains per fl. oz.:—
Quinine	35·75		4·39
Cinchonidine	33·50		3·50
Cinchonine	21·00		2·62
Amorphous	11·00		3·81
Total alkaloids	——	99·25	—— 14·32
Quinic acid			46·58
Cinchotannic acid, etc.			134·85
Total solid contents (Nearly 12 per cent. of the bark)			195·75
Deposit after adding spirit			39·70

In order to check these results the residual extracted bark used in the two experiments was examined, and in both cases it was found to contain a large amount of alkaloids, not quite equal, however, to the difference between that in the original bark and that in the liquid extract, the reason for this being that the deposit formed during the concentration of the large volume of liquid percolate was also found to contain a considerable quantity of quinine and other alkaloids, the general result being, as shown below, in the case of the Indian bark.

	Quinine.	Cinchonidine.	Cinchonine.	Amorphous.
Present in 1 fl. oz. liquid extract	4·39	3·50	2·62	3·81
Present in deposit	1·32	1·68	0·91	0·27
Residual bark contained	28·04	28·32	17·47	6·92
Total in 4 ozs. bark	33·75	33·50	21·00	11·00

These results show conclusively that if quinine and the other alkaloids of cinchona bark are to be regarded as constituting an essential factor of the medicinal properties of this drug, the process ordered by the British Pharmacopœia for the preparation of liquid extract fails in a very important particular to furnish a product that can be relied upon as fully representing those properties.

It would seem that the same failure obtains in the case of liquid extract made by other processes, if such there be, for on examining a number of samples obtained from different makers it was found that they all agreed in containing but little quinine or other cinchona alkaloids, as will be seen from the following tabular statement of the results of analysis:—

Grains per fluid ounce.

No.	Dry extract.	Quinine.	Cinchonidine.	Cinchonine.	Amorphous.
1	330	2·81	1·93	1·76	1·49
2	221	1·37	1·71	0·68	4·27
3	192	1·93	1 67	0·35	4·14
4	133	2·73	0·53	0·26	2·11
5	188	0·27	0·44	2·55	6·68
6	236	1·05	0·70	0·53	1·85
7	179	1·90	2·20	1·02	3·66
8	171	0·63	0·18	0·18	0·79
9	48	0·59	0·14	0·29	1·32

It is now nearly half a century since it was laid down as a desideratum in regard to the pharmaceutical treatment of certain drugs, of which cinchona bark was one, that while their medicinal constituents were left unchanged in their natural state of combination, they should be as far

as possible separated and removed from every part not possessing remedial virtue. More recently this has been expressed in regard to cinchona bark as the production of some preparation which might justly be regarded as "bark minus woody fibre;" but it is evident from the results above stated that treatment with cold water for extraction, as directed in the preparation of liquid extract, is quite inadequate to attain the object in view, so far as one very important part of the medicinal virtue of cinchona bark is concerned. From a chemical point of view, moreover, it is at the present day easy to perceive why this should be the the case, since there is good reason for believing that only small fractions of the alkaloids in cinchona bark exist in such a state of combination with quinic acid that by reason of the free solubility of the quinates of the alkaloids they can be extracted on treating the bark with cold water. By far the greater part of the alkaloids, probably at least four-fifths, is combined with the cinchotannic acid of the bark, forming salts that are but very sparingly soluble in water, even with the aid of heat.

If, therefore, it be desirable from a medical point of view to unite in a concentrated form—such as the liquid extract purports to be—the several medicinal constituents of cinchona bark, alkaloids as well as others, recourse must be had to improved chemical knowledge of bark for the purpose of devising a method by which this pharmaceutical desideratum may be made practicable.

In order to furnish some basis for a comparative estimate of the merits of the liquid extract and other Pharmacopœia preparations of cinchona bark, it will, perhaps, be useful to show what relation they bear to each other from a chemical point of view. For this purpose an infusion and a decoction were prepared according to the directions of the Pharmacopœia from the Indian bark above referred to.

One pint of infusion (made from 1 ounce of bark containing 25 grains total alkaloids) was found to yield, on evaporation, dry residue amounting to 74·5 grains, and containing 4 grains of total alkaloids, or rather more than one-sixth part of the alkaloids in the bark used.

One pint of decoction (made from 1·25 ounces of bark containing 31·17 grains total alkaloids) was found to yield, on evaporation, dry residue amounting to 174 grains, and containing 7·70 grains of total alkaloids, or nearly one-fourth part of the alkaloids in the bark used.

These results are of such a nature as to justify the conclusion that both the infusion and the decoction are, pharmaceutically, better preparations than the liquid extract, which, as shown above, renders available only one-seventh part of the alkaloids in cinchona bark, and, as usually met with, contains only a very small proportion of quinine or other alkaloid.

[*The discussion on this paper is printed at p.* 753.]

MICROCHEMICAL REACTION METHODS.*

BY A. TSCHIRCH.

The author describes the great advantages of the microscope in technical chemistry, especially in the examination of food, and expresses regret that many chemists consider their laboratories complete without such an instrument: he enumerates many examples of its usefulness, such as starches, textile materials, etc.; even in the domain of pure chemistry, its application is necessary in the hæmatin reaction for the detection of blood stains, the composition of urinary deposits, the search for strychnine, atropine, etc.

These advantages led to its more extensive employment in pure chemistry, and the name of microchemistry was given to it by Döbereiner. The author thinks that microchemistry must always be distinguished by a series of colour reactions; that in the same manner as the changes of colour, etc., in experiments on the large scale are examined in the test tube, so must they be similarly observed on the slide of the microscope. The actual process is simple. The objects to be examined must be either in thin sections, fine powder, or as fibres; a drop of the reagent is placed on a slide and allowed to flow slowly towards the object, the operator observing through the instrument. Many physical as well as chemical changes may thus be detected: expansion or contraction, refractive changes, commencement of coloration, evolution of gas bubbles, solution, etc. The iodine starch reaction of Stromeyer was the first to be employed with the microscope; from it is learned the topography and division of starch in plants, the way it is stored up, and the process of its conversion; this reaction has also taught the difference between pure cellulose and woody fibre and the nature of intercellular substance. The reactions with zinc chloride and iodine, and with sulphuric acid and iodine, are also striking instances of the value of microchemistry, affording an easy method of distinguishing vegetable from animal fibres, the first colouring pure cellulose violet, and the second dissolving it with an intensely blue colour, the lignin encrusting the fibres having been previously removed by maceration in nitric acid, alkalies, or Schultze's maceration fluid. Thus sulphuric acid and iodine stain cork dark-yellow, thereby affording a trustworthy test for all membranes or sections containing suberin. The solubility of pure cellulose in "cuoxam" discovered by Schweitzer is also credited to microchemistry; the reagent may be prepared by digesting copper turnings in concentrated ammonia, or by decomposing a concentrated solution of copper sulphate with ammonia until the precipitated hydroxide is redissolved.

The maceration process of Schultze is a valuable aid to operations in microchemistry; the substance is treated with nitric acid and potassium chlorate either in the cold, or in cases of obstinate samples, is boiled for a short time, when the cells are isolated by the solution of the intermediate lamellæ. Amongst the instances given of its utility in food analysis is the separation of those peculiar cells of radiating branchial form which exist in the tea leaf, and are not found in other leaves used for its adulteration (they are, however, found in some of the camellia family).

This treatment has also the advantage of dissolving the coloured incrustations of cinnamon, roasted coffee, etc., and leaving the substances ready for further examination. Potash plays an important part in microchemistry, as it renders many objects transparent which are not made so by other reagents; it was by successive treatment with potash solution, acetic acid, and iodine that Böhm was able to perceive in chlorophyll the small particles of starch which had hitherto escaped observation. The most striking success in the science is that of Sachs with Trommer's sugar test which, with slight modifications, enables the microscopist to identify, and even estimate quantitatively, cane- and grape-sugar, dextrin, gums, and albuminous substances in single cells.

The author alludes to the tinctorial methods which are employed in the examination of microbes, but which do not come under the strict domain of chemistry; he urges more extensive use of the microscope, together with the micropolariscope and spectroscope, and the study of botany and physics amongst chemists.

* From the *Arch. Pharm.* [3.], xx., 801. Reprinted from the *Journal of the Chemical Society*.

The Pharmaceutical Journal.

SATURDAY, MARCH 10, 1883.

Communications for the Editorial department of the Journal, books for review, etc. should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE PHARMACY ACTS AMENDMENT BILL.

ALTHOUGH we were unable in the previous article to do more than refer to certain general considerations respecting the Pharmacy Acts Amendment Bill, it must not be inferred that there were not other features of the Bill which would admit of being recommended to the favourable consideration of our readers. But we do not consider that the work which has been the result of long and laborious deliberation on the part of the Council is really in any need of such recommendation to the favourable consideration of thinking members of the trade. We still continue to receive evidence in support of this view, and though the demands upon our available space this week do not admit of our inserting more than one of the letters we have received on the subject, endorsing the work that the Council has done, that one comes from a source that will generally be admitted to be so deserving of respect,—and, we may say obedience to its dictates,—that we have considerable confidence in referring to it as a guide by which intending critics of the Bill may do well to gauge the desirability of their indulgence in adverse comments.

So far we may, without much danger of refutation, assume that the expressions of opinion upon the Bill are decidedly in its favour. The objections that have been raised are either based upon misconception, or upon a too ardent desire to have things as it may be contended they should be rather than in accordance with what can be at the present time. If the letter of Mr. WADE be taken, as we think it fairly may be, to represent the extreme of opposition to the Bill, we fail to perceive in it any adequate ground for the position he takes. In the first place he objects to the result of the Council's labours, because they appear to him to have been entirely on behalf of the public. On what other base, we might ask Mr. WADE, does he believe an amendment of the Pharmacy Act could be reasonably sought for? So far from such a motive and recommendation being decried, is it not to be regarded as the only feasible consideration under which a claim for legislative consideration can be urged by pharmacists? We have already said enough upon the circumstances which have led to the drafting of the Bill to make it evident that this feature of it cannot be ignored. Whether members of the Society will be materially interested or not by an enactment which would compel others not being registered chemists to label half a dozen articles "poisonous" is not the question; but it will be important, in the event of the Bill becoming law, to know that the Society has contributed to bring into operation outside the drug trade an observance of such regulations and precautions in the dealing with dangerous articles as chemists observe themselves and consider to be essential. In regard to patent medicines again, will not the use of poison labels in necessary cases contribute to relieve the registered chemist of responsibilities that are sometimes cast upon him now without reason? Absolute prevention of fatal accidents from negligence cannot perhaps be secured by any systematic observance of precautionary measures, but much of the personal inconvenience arising from incidental connection with such accidents may be thus avoided.

Mr. WADE's objection to the clause relating to branch shops involves the erroneous assumption that co-operative stores and other corporate bodies would be at liberty to carry on dispensing and chemists' retail business by engaging men on the register to conduct their business, and on that ground alone it fails to have any validity. But what is more to the point, Mr. WADE seems to forget that so long as a chemist's branch business can be carried on by an unregistered assistant there is no ground for objecting to the kind of business he deprecates. If it be made compulsory for the continuance of a branch business that it shall be under the control of a legally qualified assistant, the state of the case, so far as the public are concerned, would be no different from that which would obtain if that legally qualified assistant were in business on his own account, while at the same time there would be the further guarantee of public safety that the actual proprietor of the business was himself a qualified and competent man, who in his own interest would take care that the business was properly conducted.

Lastly, Mr. WADE's objection to the Bill because it does not provide for a legal division of prescribing and dispensing is one that indicates such a flagrant disregard of legislative possibilities as scarcely to merit serious comment. Such a division of labour between medical practitioners and pharmacists may indeed be wished for, but not by any sensible man otherwise than as a dream of the future for the ultimate achievement of which much yet remains to be done.

In satisfactory contrast to Mr. WADE's objection, are the communications addressed to the Council by the Committee of the Liverpool Registered Chemists' Trade Association and by the North

British Branch of the Society, which may be referred to as manifesting a more reasonable view of the measure intended to be presented to Parliament for the amendment of the Pharmacy Acts, and, as we believe, a better appreciation of what can be done for the advancement of pharmacy. We trust that the disposition to support the Council thus shown will be still more generally expressed, and that on the present occasion there may not again be reason to lament a want of unity, such as led to the partial failure of former efforts.

TELEPHONES.

In the second of the series of lectures on the applications of electricity, organized by the Institution of Civil Engineers, Sir Frederick Bramwell gave a most interesting account of the invention and development of the telephone and allied instruments. Prior to the invention of the telephone it was known that by making and breaking circuit at a transmitting station sounds, such as the striking of bells, could be produced at a receiving station; but these effects were independent of any corresponding sound at the transmitting station, and were analogous to those now utilized in audible telegraphy. It was also known that in a similar way the note given forth by a musical instrument could be transmitted; but it was only the note corresponding to the number of vibrations making and breaking contact within a certain time that was heard at the receiving station, and the sound was the same whether the note was derived from a tuning fork, a violin string or a clarionette. In 1862, Mr. Reiss succeeded in reproducing tones, and it is said even words, and in 1874 Mr. Barlow exhibited to the Royal Society his "logograph," by means of which he was able to depict upon a travelling band of paper the motions derived from the vibrations of a membrane under the influence of speech, but, unfortunately, the vibrations for the same syllable were found to vary with the speaker and circumstances.

The goal came in view when Professor Graham Bell, having demonstrated that the variations in the electric current, either direct or reversed, caused by break and make, are too abrupt for the reproduction of articulate speech, proposed to attain his object by keeping the circuit closed, and causing rises and falls, or reversals, as the case might be, of electricity, which should be made gradually, instead of abruptly. In one of the earlier forms of the "Bell transmitter," this was effected by placing in the neighbourhood of a permanent magnet, surrounded by a coil of insulated wire, an iron or steel diaphragm, which upon being set in vibration by the voice should induce in the coil reversed currents of electricity that could travel along a wire connecting it with the coil of a similar instrument at the receiving station, and by varying the power of the magnet there set up similar vibrations in the corresponding metal disk, which being communicated to the air should reproduce a *fac simile* of the original sound. Other modes were also devised by Professor Bell, such as the use of a battery in the line wire, and the use of two local batteries to send the current to a primary coil round a core, the line wire being connected with secondary coils acting by induced electricity. But as transmitters these instruments were necessarily somewhat feeble, since the operative electricity was dependent upon the microscopic movements of the disk set up by the sound waves produced by the speaker. The instrument most in use at the present day is the carbon transmitter devised by Mr. Edison, in which the vibrations of the disk—not necessarily metallic—are caused to operate upon a small block of carbon introduced into the circuit of a battery. The almost inappreciable variation in pressure due to the vibration of the disk is sufficient to alter the conducting power of the carbon and to cause varying currents to be transmitted along the wire to "Bell receiver" at the opposite end. Mr. Edison has also invented a "chalk receiver," in which he utilizes the fact that the friction produced by rotating a cylinder of chalk, adjusted so that its periphery presses against the edge of a stem attached to the centre of the disk, varies with the electric current passing through the cylinder. As in this case power is derived, not from the electricity, but from the hand of the operator turning the cylinder, considerable loudness is obtained. Other instruments referred to by the lecturer were Professor Hughes's "microphone," by which the most minute sounds are rendered audible; Mr. Edison's "phonograph," which records the vibrations produced in a disk under the influence of speech on tinfoil, in such a way that they can be reproduced at pleasure; and Professor Bell's "photophone," in which the variations produced in the conductivity of a selenium cell through vibrations set up in a beam of light by sounds received on a disk in connection with a mirror allow of the sounds being reproduced without the intervention of any wire between the transmitter and the receiver.

In the United States the telephone is used more freely than in this country, the city of Washington, with 120,000 white inhabitants, having 800 telephones. In England the spread of the telephone has been retarded to some extent by legal disputes, but it is now making considerable progress. On the 28th of February, 1881, there were, independently of private lines, 845 subscribers to the London Exchange of the United Telephones Company; on the same day in 1882 this number had increased to 1505, and in the present year to 2541. The use of the telephone by each subscriber has also augmented, until it now averages 7½ calls per subscriber daily, which for a subscription of £20 per year represents a cost of 2*d.* per call, usually involving a message each way.

On Thursday evening Lord Carlingford introduced into the House of Lords a "Bill for the Consolidation and Amendment of the Law relating to Medical Practitioners," which was read a first time and ordered to be printed. The second reading is fixed for Thursday next, but up to the time of going to press the Bill had not been issued.

* * *

Recently allusion was made to the omission from the Partnerships Bill of the clauses in which last year it was proposed to deal with the Registration of Firms. These have now been introduced separately as a "Bill for the Registration of Firms and of Persons carrying on Business under Names or Styles other than their own." It contains a provision that "every firm carrying on business or having any place of business in the United Kingdom, under a firm name which does not consist of the full or the usual names of all the partners or all the acting partners without any addition" shall effect registration under the Act, and among the particulars to be supplied to the Registrar are "the full name, usual residence, and other occupation, if any, of the person or persons carrying on the business."

* * *

A similar course has been taken with respect to the provisions for the establishment of limited partnerships, which have now been brought in as a separate Bill. The limited partnership proposed would necessarily contain one or more persons, called "general partners," who would be jointly liable for all the debts and obligations of the firm, and one or more persons to be called "limited partners," who would only be liable to a certain specified extent. Under these conditions it is satisfactory to find that the Bill would render compulsory the registration of such firms with the names, residences, and usual occupations of all the partners, both "general" and "limited."

* * *

By the courtesy of the Registrar we have received a copy of the Calendar of the Pharmaceutical Society of Ireland for 1883, and we regret to observe that although the number of Pharmaceutical Chemists in Ireland is 219, or 18 in excess of that of last year, the number of members of the Irish Society is only 81, showing a decrease of 11. Of these 81, 18 were named in the Act, 2 are Life Members, and 61 are Subscribing Members.

* * *

According to some statistics published in the *Journal de Pharmacie*, 200 first class students in the Superior School of Pharmacy, Paris, went up at the conclusion of last term for the final examination at the end of their studies; of these 161 passed, and 39, or 19·5 per cent., failed. There were also 204 second class candidates, of whom 93, or 45·4 per cent., were rejected.

* * *

The Committee which has been nominated to report upon the Bill for the amendment of the law regulating the practice of pharmacy in France, recently introduced into the Legislative Assembly by M. Faure, consists of two medical men, two pharmacists, one druggist, a literary professor, and five lawyers.

* * *

According to the *Lancet*, a recently issued 'Additamentum ad Pharmakopœam Hungaricam' includes carbolized catgut, carbolized silk, salicylic gauze, salicylic wool, and carbolized drainage tubes.

* * *

In bringing the subject of the new United States Pharmacopœia before the Boston Society for Medical Observation, at a recent meeting, Dr. B. F. Davenport made some pertinent remarks upon the practice of prescribing proprietary preparations, for which he said physicians in the United States had now no excuse. "What encouragement," he asked, "is there to pharmacists to become skilful and expert if the physicians make no demand upon them, but oblige them to send to a distance for preparations which they could make as well or better themselves? Any apprentice could pass over the counter and take pay for ready-made preparations. The pharmacist thus defrauded of his proper functions . . . . is degraded to the vocation of a mere shopkeeper."

* * *

Dr. Davenport further referred to the injury resulting to medical practitioners themselves through their thus promoting the keeping in stock of the very medicines they are accustomed to prescribe, done up in convenient packages, accompanied with full particulars as to the diseases they are supposed to cure, the doses, and method of administration. He pointed out that the druggist has the opportunity of becoming just as familiar with such medicines as the physician, since both get all their information from the printed wrappers, and he asked why a patient should go to a physician when a druggist can show him his own physician's printed certificate that the contents of a certain bottle are the best cure for the disease from which he is suffering.

* * *

An Evening Meeting of the North British Branch will be held in the Society's Rooms, 119A, George Street, Edinburgh, on Wednesday next, the 14th inst. The papers announced are a "Descriptive Note of a New Form of Hot Air Chamber, suitable for Pharmaceutical Purposes," by Mr. Thomas Maber; and "An Examination into the Acetic Ether of Commerce, with Suggestions for the Improved Manufacture thereof," by Dr. Inglis Clark.

* * *

The Anniversary Meeting of the Chemical Society is to be held on Friday, the 30th inst., at 8.30 p.m. At the ordinary meeting on Thursday next a paper will be read on "Some Condensation Products of Aldehydes with Acetoacetic Ether and Substituted Acetoacetic Derivatives," by Mr. F. E. Matthews.

* * *

The next meeting of the Chemists' Assistants' Association will be held on Wednesday, the 14th inst., when a paper on "Porcelain, its Manufacture and Composition," will be read by Mr. Herbert Cracknell.

* * *

At a preliminary meeting held on Monday last, the students attending the School of Pharmacy decided to attempt the formation of a Cricket Club. With this object an adjourned meeting will be held in the Society's house on Tuesday next, at 8.30 p.m., at which students and assistants desirous of joining the club are invited to attend.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL.

Wednesday, March 7, 1883.

MR. MICHAEL CARTEIGHE, PRESIDENT.

MR. SAMUEL RALPH ATKINS, VICE-PRESIDENT.

Present—Messrs. Andrews, Borland, Bottle, Butt, Churchill, Gostling, Greenish, Hampson, Hills, Radley, Richardson, Robbins, Savage, Schacht, Squire, Symes, Williams, Woolley and Young.

The minutes of the previous meeting were read and confirmed.

The following, being duly registered as Pharmaceutical Chemists, were respectively granted a diploma stamped with the seal of the Society:—

Ball, Henry.
Dangerfield, William Henry.
Deeks, William Thomas.
Prosser, Frank Henry.
Wilson, Joseph.

Elections.

MEMBERS.

Pharmaceutical Chemists.

The following, having passed the Major examination and tendered their subscriptions for the current year, were elected "Members" of the Society:—

Cherrington, Geo. Widdowson...Newark-on-Trent.
Dangerfield, William Henry ...London.
Nicholson, Richard .....Darlington.
Prosser, Frank Henry .....Coleshill.

Chemist and Druggist.

The following registered chemist and druggist, who was in business on his own account before August 1, 1868, having tendered his subscription for the current year, was elected a "Member" of the Society:—

Paterson, James .....Aberdeen.

ASSOCIATES IN BUSINESS.

The following, having passed their respective examinations, being in business on their own account, and having tendered their subscriptions for the current year, were elected "Associates in Business" of the Society:—

Minor.

Adams, Benjamin.....Mansfield.
Bainbridge, Arthur .....Acton.
Beall, Samuel Smart .....Cambridge.
Bostock, Samuel Pass .....Hyde.
Clarke, Ethelbert.....Forest Hill.
Davies, John Myrddin ....Swansea.
Fletcher, Ellis .....Atherton.
Freeman, John Henry.....Lower Tooting.
Gardner, Charles Edward .....Colesberg.
Hill, Francis.....Macclesfield.
Moore, Frank Philip .....Dumfries.
Morgan, Alfred William.....Chatham.
Pritchard, Lewis T. Richard ...Aberavon.
Wood, William Arlington .....Bradford.

Modified.

Garrett, Thomas Philip .....Newport (Mon.).
Steeper, Samuel .....Swineshead.

ASSOCIATES.

The following, having passed the Minor examination and tendered (or paid as Apprentices or Students) their subscriptions for the current year, were elected "Associates" of the Society:—

Barlow, Arthur.....Hull.
Boyd, Alexander .....Glasgow.
Caffyn, Ernest John.....Crawley.
Clague, Thomas Maltby .....Douglas.
Corder, Edward .....Norwich.
Doo, James Emile .....Atherstone.
Hadfield, James Havelock .....Manchester.
Heyes, Thomas Harry .....Bolton.
Houfe, Robert William .....York.
Jenkins, Thomas .....Swansea.
Lockyer, Joseph Ernest .....Deptford.
Mason, Hubert Huxley .....Clevedon.
Mitten, Flora .....Hurstpierpoint.
Neve, Annie .....London.
Ranken, Charles .....Sunderland.
Rees, David ....Newcastle Emlyn.
Sewell, Edward Ernest .....Whitby.
Smith, William Thomas .....Bath.
Stacey, Frederick Charles .....London.
Thompson, Charles Letchford...London.
Thompson, Frederic.....Scarborough.
Turner, Alexander .....Dumfries.
Woolliscroft, Henry.....Wrexham.
Young, Robert John .....Bideford.

APPRENTICES OR STUDENTS.

The following, having passed the Preliminary examination and tendered their subscriptions for the current year, were elected "Apprentices or Students" of the Society:—

Abbott, Herbert Edw. Tripp ...Lowestoft.
Arthur, John.....Chesterfield.
Atherton, Albert George.....Tunbridge Wells.
Badcock, Henry Southgate R...South Petherton.
Barrett, Arthur Albert .....London.
Benjamin, John Blake.....Brecon.
Bishop, Cecil.....Brading.
Chattaway, William.....Leicester.
Cuff, Joshua Harcombe .....London.
Davis, Francis M. .....Leominster.
Deck, Arthur Albert .....London.
Dorning, Herbert Rigby .....Chorley.
Fletcher, Francis Round.....Netherton.
Hacon, Elizabeth Constance ...London.
Hayton, William Pattinson.....Wigton.
Henderson, John George.....Middlesboro'.
Jackson, Albert Ernest .....Ipswich.
Jones, James .....Newcastle Emlyn.
Jones, Richard Alan .....Holyhead.
Kingston, William Richard .. London.
Lane, Henry .....Wednesfield.
Livesey, William Forrest .....Preston.
May, Samuel Augustus .....Jersey.
Owen, David James.....Swansea.
Parkinson, Joseph, jun. .....Preston.
Payne, William .....Wendover.
Perkins, Frank .....Newcastle-under-Lyme.
Price, Charles Cleaver.....Bristol.
Riddiough, Fred. .. ..Leeds.
Rutter, William .....Masham.
Smith, Edwin ....Pendleton.
Somerville, Wm. Alexander ...Chorley.
Spyer, George Nathan.....London.
Stevenson, Geo. S. Cartwright...Portobello.
Steward, Josiah William.....Bridgnorth.
Wallbridge, John George .....Liverpool.
Widgery, John .....South Molton.
Wokes, Thomas Siminson .....Hull.

Several persons were restored to their former status in the Society upon payment of the current year's subscription and a fine.

Restorations to the Register.

The following persons having severally made the required declarations and paid a fine of one guinea, their names were restored to the Register of Chemists and Druggists:—

David Lindsay Macfarland, 503, Lawnmarket, Edinburgh.
William Rangeley Radford, 4, Enfield Road, South Kingsland, London, E.

Additions to the Register.

The Registrar reported that—
William Adams, 19, Dudley Road, Birmingham; and
Edward W. Lane, Dameagnes Street, Nottingham;
having made statutory declarations that they were in business before the passing of the Pharmacy Act, 1868, and these declarations having been duly supported by qualified persons, their names had been placed on the Register.

Local Secretary.

Mr. Garrad Baker was appointed Local Secretary at Chelmsford, in place of Mr. C. P. Baker, deceased.

Auditor's Report.

The Secretary laid on the table the Auditor's Report for the financial year ending, December 31, 1882.

Several remarks were made upon the figures, the Council going into committee for the purpose.

Reports of Committees.

FINANCE.

The report of this Committee recommended the payment of several accounts; that £800 be invested in Consols on account of the Benevolent Fund; and that £3000 New Two and a Half per Cent. Stock be purchased on account of the General Fund. It also stated that the Committee had considered the desirability of changing the mode of investment of the Society's funds, and recommended that a portion, not exceeding three-fourths of the invested capital of the Society, be re-invested as occasion might offer in freehold ground rents or freehold land, and that the President, Vice-President and Treasurer for the time being should be constituted a committee to watch such opportunities as may appear to them desirable to secure investments for the Society either in freehold ground rents or freehold land.

The President explained that the Committee had thought it desirable to purchase New 2½ per Cent. stock, instead of Consols or New 3 per Cents., because while the return per cent. was only 1*s.* 3*d.* less there was a probability of this Stock rising in the market, and it was considered likely by financiers that the Three per Cents might be paid off at par at no distant date, and this would entail a loss. The main point, however, in the report was that which recommended the investment of a portion of the funds in ground rents or suitable freehold land. The Society was authorized by the Charter to invest in such securities, though not in debentures, and the high price of Consols and New Three per Cents had led the Committee to think that it would be desirable to invest some of the Society's property in freehold ground rents, which would yield an interest approximate to that which was now received, with a possibility and probability of getting a greatly increased income at a future time. The question had been discussed on several previous occasions, but Government Stocks had then always been at a much lower price than now, and the advantage attending investments in them of being realizable at any moment had hitherto led the Council not to entertain the proposal. But now that the property of the Society was considerable, about £20,000 on the General Fund Account, and a similar amount on that of the Benevolent Fund, the question whether some portion of it could not be so dealt with as to give a prospect of greatly increased benefit in the future was of considerable importance. Freehold ground rents were not unfrequently in the market; they paid in some cases 3 per cent. only, in others as much as 4 per cent., the rate varying according to the time at which the reversion would fall in. The Committee was of opinion that, with regard to the General Fund, if an investment could be obtained which would return even only 3 per cent. it would be wise to take it, looking to the probability of a much larger return in future. Freehold ground rents were generally secured by property of an annual value of at least five times the amount of the ground rent. By purchasing ground rents which had fifty or sixty years to run the Council would be investing in a way which need not diminish the present income, and at the same time would be providing increased means for carrying on the Society by its successors in future years. With regard to the General Fund, as it was not absolutely necessary that the whole of the interest now received should be maintained, it was suggested that the endeavour should be to select for investment ground rents which would fall in at an early date rather than to obtain the highest rate of interest; but with regard to the Benevolent Fund, it would be desirable to buy ground rents having a long term to run, in order to obtain as large a present income as possible. Nearly all the Consols now standing in the name of the Society had been purchased at about 90, so that at the present price a considerable profit would be obtained on the sale, for re-investment. As to the purchase of land, it was not intended to buy large pieces of land, and cut it up in building lots, or to speculate in land in any way; but if it happened to come to the knowledge of the Committee that there was a field on the outskirts of town, on which there was a moral certainty that buildings must be erected sooner or later, the land might be purchased and let for building purposes. It could not be expected that such opportunities of investment would be found every day, and, therefore, the Council was asked to authorize the immediate investment of cash in hand as stated in the report, and that the President, Vice-President and Treasurer should have power to look out for opportunities for re-investment in ground rents or land to the extent of not more than three-fourths of the total amount of invested capital. By this means it was hoped that the present income for benevolent purposes would be secured, and that in thirty or forty years' time the Society would be placed in a much better financial position than anyone could now contemplate.

The Council went into committee to discuss this matter. On resuming, it was moved by Mr. Greenish and seconded by Mr. Symes—

"That the report and recommendations of the Finance Committee be received and adopted."

An amendment was moved by Mr. Williams—

"That the report and recommendations of the Finance Committee be received and adopted, with the exception of that portion which recommends the re-investment of part of the Society's funded capital."

Mr. Richardson seconded the amendment, which was put to the vote with the following result:—

For the Amendment.—Messrs. Bottle, Richardson and Williams.

Against:—Messrs. Andrews, Atkins, Borland, Butt, Carteighe, Churchill, Gostling, Greenish, Hampson, Hills, Radley, Robbins, Savage, Schacht, Squire, Symes, Woolley and Young.

Mr. Hampson then moved another amendment, which was seconded by Mr. Radley—

"That the report and recommendations of the Finance Committee be received and adopted, with the exception of the recommendation to re-invest a part of the Society's funded capital in freehold land."

The Council divided, with the following result—

For the Amendment:—Messrs. Atkins, Borland, Bottle, Gostling, Hampson, Radley, Savage and Squire.

Against:—Messrs. Andrews, Butt, Carteighe, Churchill, Greenish, Hills, Robbins, Schacht, Symes, Woolley and Young.

Mr. Williams and Mr. Richardson were present, but did not vote.

The original motion was then put and carried.

EDUCATION AND EXAMINATION.

The following report was presented:—

Report of a Committee consisting of the President, Vice-President, Messrs. Bottle, Greenish, Hills, Schacht and Symes, appointed by the Council in July, 1882 (*Pharm. Journ., July* 8, 1882, *p.* 35), *for the purpose of considering the best method of giving effect to the resolutions of the Council of April* 5 (*Pharm. Journ., April* 15, 1882, *p.* 845), *upon the report of the Special Committee appointed to inquire into the relation to each other of Pharmaceutical Education and the Pharmaceutical Examinations,—and of reporting thereon to the Council; together with any suggestions it may desire to advance as the result of its deliberations.*

The Committee considers it unnecessary to recapitulate the various steps by which the subject of its report has reached its present position. It has nevertheless endeavoured to weigh with due care every fact and consideration that has arisen throughout the investigation; and it now desires to present a series of recommendations, which to some extent modify and amplify those previously presented to the Council.

Recommendations.

The Committee recommends the following as the course to be required of every candidate for qualification to practise pharmacy.

1st. The candidate must pass the Preliminary examination of the Pharmaceutical Society, or one of the examinations the certificates of which are accepted in lieu thereof, and be registered as a Pharmaceutical Student.

2nd. The pharmaceutical student must then enter the pharmacy of a pharmaceutical chemist, or a registered chemist and druggist who keeps an open shop, as apprentice or pupil, or in some other capacity as a learner; and be so employed for three years.

Note.—During these three years he may or may not, at discretion, attend one or more of the courses of lectures that form part of the "curriculum" approved by the Council in April, 1882 (*Pharm. Journ.*, April 15, 1882, p. 846).

3rd. After the expiration of the three years shop experience, the pharmaceutical student is eligible to offer himself for the *first portion* of the qualifying examination on production of evidence of registration as a pharmaceutical student and of having been employed for three years subsequent to such registration in the shop of a pharmaceutical chemist or a registered chemist and druggist.

This *first portion* of the qualifying examination to be a written one and to include the following subjects:—Prescriptions, Pharmacy and Theoretical Chemistry.

This *first portion* of the qualifying examination to be conducted in London, Edinburgh, and such a number of centres in the provinces as will allow the superintendence of each examination by a member of the Board of Examiners.

4th. An interval of not less than *one year* must elapse between the date of passing the *first portion* of the qualifying examination and the date of entering for the *second portion* of that examination. During that interval the above-named "curriculum" *must be completed.*

5th. On entering for the *second and final portion* of the qualifying examination, the pharmaceutical student must produce evidence of being twenty-one years of age and of having fulfilled the conditions mentioned in the previous paragraph.

This *second and final portion* of the qualifying examination to be practical and "*viva voce*," and to include the following subjects:—Practical Dispensing, Botany, Materia Medica, and Chemistry.

This *second and final portion* of the qualifying examination to be conducted in London and Edinburgh only.

With respect to the "Curriculum" of study already approved by the Council (*Pharm. Journ.*, April 15, 1882, p. 846), the Committee recommends that in the announcement with respect to the time to be occupied in the suggested course of Practical Chemistry the following modification be made.

Instead of—

"*Time*: 5 months, 3 hours daily,
or
3 months, 5 hours daily,"

Read—

"*Time*: 10 months, 2 hours daily,
5 months, 3 hours daily,
or
3 months, 5 hours daily."

And in the foot-note that accompanies the above notice

Instead of—

"A modification of the time to be occupied in this course would be accepted provided such modified course extend over a period of not less than three months, and that not more than five hours in any single day are occupied in its work."

Read—

"A modification of the time to be occupied in this course will be accepted provided such modified course extend over a period of not less than three months, and not more than twelve months, and that not more than five hours in any single day be devoted to practical work."

The Committee further recommends that these recommendations and those previously adopted by the Council be incorporated into the bye-laws, according to existing regulation, and that they be announced to come into force on and after December 31st, 1887.

NOTE.—The effect of this will be that all candidates who shall pass the Preliminary examination AFTER December 31, 1883, will NOT be eligible to present themselves for the first portion of the qualifying examination until the expiration of a period of three years from the date of their having been registered as having passed the said Preliminary examination. During these three years they must be engaged in acquiring shop experience. They will also be required to produce certificates of having passed through the curriculum of study already adopted by the Council before presenting themselves for the final portion of the qualifying examination.

Candidates who shall have been registered as having passed the Preliminary examination BEFORE December 31, 1883, will be eligible to present themselves for the Minor examination, under the regulations now in force, during and up to the end of the year 1887.

Mr. SCHACHT moved:—

"That the report and recommendations of the Education and Examination Committee be received and adopted."

He said he should not trouble the Council with any remarks, the report having been in the hands of the members for nearly a month, and he hoped that it had received thorough attention. It would be recollected that at the date named in the preamble a series of resolutions was adopted by the Council. On that occasion he found himself, with some other gentlemen, in a minority on certain points, but they thought it was possible that further consideration might alter the opinions of some of the Council, and it was fair to state that some of the recommendations contained in their report did refer to some of those points about which there was then a difference of opinion. The considerations which then led the minority to certain conclusions had been amplified and extended in certain directions,

by which he ventured to hope that the matter being broadened over they might find themselves on more common ground. Those points referred to what was called clause 4 in the old recommendations; he would simply say that in the recommendations now presented, the whole process by which the student should accomplish his qualification was tabulated in a manner which was thought to be the most easy way of suggesting improvements for the future. With reference to the differences between these recommendations and those adopted by the Council last April, there was the division of the final technical examination into two portions, one of which was to be as it were preliminary, and the other final. The Committee thought that the first portion might fairly be conducted in the provinces, notwithstanding there would be many who would be tempted to dissent from that if it were the final and qualifying examination, but as it was simply preliminary to the final, the Committee thought the objections were not such as to over-ride the advantages which would attend such a division. In addition to that it was thought that the ease with which the whole business of the examination could be conducted was such as would justify its adoption; the comfort to the candidate, and the absolute certainty with which it could be conducted would overbalance any disadvantages. It would also be noticed that the final portion was distinctly declared only to be capable of being conducted in London and Edinburgh at present. The further alteration was that the time to be occupied in one portion of the curriculum, that which applied to practical pharmacy, should be capable of extension to a longer period, the purpose being to permit those who had the opportunity of taking up their practical chemistry during the time of pupilage to do so, so that they might devote more time afterwards to other portions of their work. He must say with regard to this ideal scheme of training, that on considering it very carefully, he had failed to detect any spot in it. It seemed to him to be the most exactly correct process by which it could be hoped to train the future pharmacist which his mind could conceive. It might, perhaps, present certain difficulties, but the whole result would be so great a gain on the system which at present existed, that he most sincerely hoped that his colleagues would see their way to its adoption.

Mr. Symes seconded the motion.

Mr. Hampson said he wished to move an amendment, but it must not be supposed that because he did so he had an antagonistic feeling towards any sound educational scheme. He believed in education all round, and, therefore, it was with considerable diffidence that he took exception to certain parts of the report. He did, however, take exception to the third, fourth and fifth recommendations and would move as an amendment that those be omitted. About twelve months ago he felt it necessary to retire from the Committee, when the first report was presented to the Council, and a vote taken with the result that the fourth recommendation was eliminated. He still held the same views as he did then, and he would briefly state his reasons for so doing. He must first go back to the time when this educational inquiry took place, and if he went far enough it would be found that the inquiry merely sprang out of the astute brain of one of their professors. No doubt he represented a certain amount of professorial opinion; he represented the impression that there was a great deal of cramming going on and this was really a sort of anti-cram inquiry. So far so good, and he admitted that inquiry was perhaps necessary, and it resulted in the proposal of a curriculum. With that he agreed most heartily, because he believed it was to the interest of the student, and it had a special charm to him, because it would have the effect, if brought into operation, of establishing sound educational centres, which would be the backbone of any educational system. But he hesitated to go further; he believed the imposition of the curriculum was a sufficient guarantee for sound education. The fact that a number of candidates were regularly rejected was a security that only capable men were admitted to practise pharmacy. But if all these arbitrary conditions were instituted, the possibility of cramming would still continue. If there were a regular course of education provided it would remove any obstacle which arose from imperfect education. He might be old fashioned, nevertheless his impression was that the training of pharmacists in the present day was quite equal to the demands of the public. There had been no outside demand made by the public, and the Government officials who attended the examinations had not represented that they were insufficient or ineffective. He heartily agreed with the plan of insisting on the apprentice passing the Preliminary examination before he was articled, and also in insisting upon apprenticeship, and that there should be a curriculum, but he objected to imposing other conditions beyond that, which he thought objectionable and entirely unnecessary. Then the question arose, whether the Council had power to introduce these changes. He believed the Act of Parliament had been unduly stretched already, in imposing the condition that a candidate should be twenty-one, which was distinctly illegal in his opinion, and the division of the examination into two parts, as now proposed, he believed was utterly beyond the powers the Society now possessed. It would appear from the report that even according to the present state of the law an endeavour was to be made to stretch the Act of Parliament still further. What would be the effect of this scheme on the country? It would be a very long time before it could possibly come into operation, for certain educational centres would have to be established, and he would recommend the Council rather to defer the discussion than to come to a hasty conclusion upon it. He objected to dividing the examination into two parts and making the candidate wait twelve months between. It was all very well to style the first examination a preliminary part, but it was nothing of the sort, it was a distinct examination. It would be really establishing two examinations. That might be a good thing, though he did not believe it was, but it was illegal. The tendency would be if this scheme came into operation for the two distinct examinations to become stricter and stricter, as all examinations did. He wished the state of pharmacy were such that such a scheme could be justly established, but it was not so. If chemists had real pharmaceutical work to do in their various businesses the whole thing would be a bagatelle; everyone would take an interest in the movement and education would become more perfect. But he maintained that the men who passed already, the average men, were, as a rule, quite equal to the demands of the occasion, and equal to the safety of the public. The man who passed his examination went back to his business and found that his learning was useless except as a mental exercise. If the Council accepted the curriculum and left out the other portions it would meet all the necessities of the case. He would move—

> "That the report and recommendations of the Education Committee be received, with the exception of the recommendations numbered 3, 4 and 5."

Mr. Williams seconded the amendment and said he should have been prepared to go even further. He should like to speak at some length on this question, but was not well enough to do so. He agreed with what Mr. Hampson had said, and, of course, he agreed that an apprentice or pupil should pass the Preliminary examination before entering the trade, and also that he should pass a certain time in the actual practice of the business, as an apprentice or student, because that was the real mode of education. He was quite aware that in practice it was often very deficient, because in many cases there was not the means for apprentices to acquire a knowledge of their business properly, but at any rate the shop experience he looked upon as an essential point. There was no doubt

a curriculum of some sort was also essential to the education of the chemists of the present day. They had to occupy a somewhat scientific position before the public, and he believed they had in the past lost a good deal of what would have been a legitimate source of profit through want of the scientific acquirements they ought to possess, and which he trusted the curriculum would tend to give them. But to draw a hard and fast line and to say exactly what the curriculum should be, and to leave no elasticity in these regulations, was in his opinion a mistake. It seemed to him an arbitrary condition to say that there must be twelve months between the two portions of the examination, and he should be sorry to accept it, especially as he understood the whole of the curriculum must be gone through in that year.

The PRESIDENT said what was intended was that a man might begin his curriculum during the period of his apprenticeship; but if after passing the first examination he had not completed the curriculum, then he must complete it before passing the second portion.

Mr. WILLIAMS said the objection remained, as Mr. Hampson had stated, that the examination was divided into two, and he believed that to be objectionable and illegal. Probably certain clauses had been put into the new draft Bill which had been submitted for the approval of the Council at their last meeeting with the view of enabling the Council to alter the examinations in the way here indicated, but at present he was quite clear the Council had no legal power to do so, and on that ground alone he should feel bound to vote against those recommendations. The curriculum, as here laid down, was simply a copy of the ordinary curriculum of the Pharmaceutical Society's School, which some thought had not proved in practice as satisfactory as could have been desired. It might possess many merits, but he did think it would be wiser to leave the new curriculum more elastic. Another point he had remarked was the recommendation that this scheme should come into operation on and after December 31, 1887, and it seemed to him an absurdity to give a date to a thing which the Council had no legal power to carry out.

Mr. WOOLLEY was much disappointed to find Mr. Hampson opposing this scheme, which he considered a distinct advance in the educational progress of the Society. Mr. Hampson's last objection was that the position of pharmacy was not what it ought to be; in fact, he brought forward the old objection, which they were getting rather tried of in the country, that the game was not worth the candle. As long as men were found who would take up that position, the game never would be worth the candle, because they were not the proper men to play the game. Then he went on to say that the pharmacists of the present day were equal to the demands of the occasion, and no doubt there were a great many men who were equal to the occasion; but taking the whole body of pharmacists throughout the country, he thought they were not equal to the occasion. Only the other day a meeting of pharmacists was summoned in Manchester to consider the Pharmacy Bill, but only six persons were present; that showed that the men were not equal to the occasion. It would be a great advantage to every young man about to engage in pharmacy, to have his whole career before him and to know what he would have to do, which up to the present time had not been the case. There were many cases of disaster, men presenting themselves several times for examination and being rejected; all that would be done away with in future to the benefit of every one. Mr. Hampson doubted the examinations being inefficient; but it had been shown repeatedly that the results had not been what they might be, and the only way of overcoming the difficulty was to have a certain curriculum which the young men must follow, and be able to show that they had given a certain amount of solid study to their profession. Mr. Hampson deprecated coming to a hasty decision, but how long was it necessary to consider this. Had they not all had time to make up their minds? Dividing the examination into two parts was to his mind the greatest boon; he should have been only too glad if his examination had been divided into two parts, and he could have gone through the theoretical portion of it in the country and come up to London afterwards to complete his qualification.

Mr. HAMPSON wished to explain that his reference to the efficacy of the education and examination was simply this, that there was no proof of any complaint on the part of the Government assessors that the examination was inefficient. Unqualified men had been turned back invariably and efficient men had passed.

The VICE-PRESIDENT said that all he had to say had been said before. There were certain propositions of Mr. Hampson he did not for a moment dispute, but he could not agree with his last remark, because it was not a question of the efficacy of examinations but of education; it was there where the deficiency lay. Notwithstanding the supineness of Manchester, which might be taken as typical of the state of feeling in the country generally, he was disposed to go largely with him, that, taking the average of the men passed through the mill and receiving the stamp of authority, they were men fairly up to the mark; but the special object of promoting this educational measure was to promote the benefit of the students. He had been deeply impressed with the fact during the twelve months he had been in the examination room, that many men came up unprepared. He had letters in his possession bearing out the conclusion that there had been in early days scarcely any advantages in the country for education, and many of these men had trusted to get up what was required by three, four or five months' study, and he had even known of a man coming up for only a fortnight's training and expecting to pass. They all agreed as to the advisability of a curriculum, and with regard to the division of the examination he agreed with Mr. Woolley that it would be an immense advantage to the student. The theoretical portion he could acquire from books in the country and his mind would then be relieved of a large amount of anxiety when he came up to London. With a limited area for investigation, he would be able to concentrate his attention on that, and would consequently be in much better form for passing the test which was required. He was convinced that the written portion of the examination might be conducted with perfect integrity in the country. In the main he agreed with the statements of Mr. Schacht that this scheme had a great many merits, that there were very few spots about it, and he hoped it would be carried by a large majority, and go forth to be tested by experience, because he was satisfied it was in the interests of the students, the masters and the public.

Mr. BORLAND said, according to the opinion expressed by Mr. Hampson, the attempt to impose a curriculum under the existing Act was illegal; but he had always been of opinion that the endeavour to enforce this curriculum would be carried out in conjunction with the proposed Act of Parliament. The discussion had hitherto failed to a considerable extent to take into consideration some of the practical results which would follow from this proposed curriculum. In the discussion last year he remembered bringing forward an objection to the botanical part, and he was then asked to ascertain the conditions which prevailed in Scotland. He had done so, and he had found that in the three Universities in Scotland the time devoted to botany was only three months, and the curriculum here imposed a term of five months, so that students, if that were insisted upon, would have to devote two years to botany, unless special arrangements were made for their benefit. Otherwise they would have to study at inferior schools, where the very system of cramming, which was so much objected to, might very likely be carried out. He did not say there were not schools in Scotland capable of teaching that science; at

the same time it would be greatly to the benefit of young men coming into their ranks if they were induced to attend the Universities. With regard to the fourth clause, providing for an interval of not less than one year between the two portions of the examination, he should have preferred it to be six months, because he thought a young man who had passed his college curriculum, if he were willing to present himself, should be allowed to do so, providing he were twenty-one years of age. As he could complete his curriculum in five months if he chose, there did not seem to be any necessity for forcing him to take an interval of seven months. It had been stated over and over again that when a boy left school he should present himself for the Preliminary, and, on the same grounds, when a man left the University he ought to be able to present himself for the final examination. He also agreed with Mr. Williams that the clause fixing a time for the scheme to come into operation should be omitted.

Mr. SYMES said the most potent objection to this scheme was that it was beyond the powers of the Council to carry out; but the members of the Council were not solicitors and were not going to discuss the power they had under the Act. When the motion came before the Council on a previous occasion, and a large portion of the recommendations were adopted, this question was not raised, and the sole question before them was whether these changes were desirable. He should rather see the whole of the recommendations rejected than that the scheme should be adopted piecemeal. This was not done in the interest of the Council, but principally in the interest of students, though perhaps they would be the last persons to think they were considered. They might think there was some little hardship upon them, but he was satisfied that anyone who would carefully go into the matter would conclude that it was in their interest, without being against the interest of anyone else, that this was proposed. Mr. Hampson asked for evidence that this improvement was necessary, and he had made a note at the time that most of the evidence was of a negative character; pharmacists had not that social position that they would have if they were, as a whole, educated up to the point they ought to be for the requirements of their class. But Mr. Hampson himself supplied a much better answer later on to the effect that the business was in a most unsatisfactory condition. That, in itself, was evidence that improvement was necessary. It was an old remark, that so long as men grumbled at their position and objected to do anything for the advancement of pharmacy, so long would it be where it was now. Mr. Williams had referred to the curriculum in force at the Society's school, which he said had not answered very well; but he must say he had been in the laboratory a short time that morning and he was pleased to find it so full and working so satisfactorily. Mr. Hampson had not ventured on one statement which he had pressed strongly on a previous occasion, and that was the objection he made to having any portion of the examination conducted in the provinces. He had thought a great deal over that objection when put forward originally, and came to the conclusion that it was entirely groundless. He was quite satisfied that if in a centre like Liverpool there were twelve candidates, who, if they had to come to London, would have to expend some £30 or £40, the whole thing could be done by the Society quite as efficiently for as many shillings. If these young men paid their fees they were entitled to be examined at the expense of the Society and not at an increased expense to themselves. It was a different thing to the final examination which gave them their qualification, and the Committee had been very particular in stating that this first portion of the examination is not to entitle the candidate to any kind of document whatever; his name would simply be recorded as having passed and that would entitle him to come up for the final and qualifying examination. He did not believe in any scheme being perfect, but this having anticipated almost every objection which could be raised to it he hoped it would receive the unanimous support of the Council.

Mr. SAVAGE said there was a feeling in the country that the present educational arrangements were more than sufficient to qualify a man for the position which he afterwards occupied. The evidence brought forward was the large number who failed to get through the examination, but it seemed to him that that led to the directly opposite conclusion. Only last week he had a communication from a gentleman, formerly a member of the Council, objecting to the curriculum on the ground that it would entail greater expense on the candidate; but he felt convinced that the curriculum was necessary, for the large number of failures indicated that the Preliminary examination had not been sufficient.

Mr. GREENISH agreed in the main with the report of the Committee, and being a member of it perhaps some apology was necessary for repeating his objection on the present occasion. It could not be said that he was an opponent of systematic education, for long before the curriculum became a pass-word he had published one or two papers in the Journal advocating a course of study similar to that required in North and South Germany, or as near to it as could be attained in this country. He could not go quite so far as Mr. Hampson's amendment; but he still held the same objections to the scheme which he mentioned twelve months ago, and he had remained on the Committee when he thought he ought perhaps to have retired, with a view of having his errors pointed out and acquiring some information which might enable him to change his opinion. At the last moment, however, he was obliged to say that he was not convinced on one point, and that was the very important point of the division of the examination, which involved one portion being a written one. Mr. Symes had just stated that the first portion was not a part of the qualifying examination; but seeing that it included prescriptions, pharmacy and theoretical chemistry, he (Mr. Greenish) could not agree to that, and he also took it that as a man could not enter for the second portion until he had passed the first, that first part must form a part of the qualifying examination. He also objected to the division. The three technical subjects of the present examination were reading prescriptions, pharmacy, and dispensing, and they formed the real portion of the examination on which the safety of the public mainly depended. After a candidate had passed the examination room his botany might get rusty, and even his materia medica, and also his chemistry, and in seven cases out of ten they did; but if he were to be a pharmacist at all, and if the safety of the public were at all considered, accurate dispensing, correct reading of prescriptions, and pharmacy must remain to him. Whether it was conducted in town or country he must express his conscientious conviction that an examination in prescriptions and pharmacy could not be so well conducted by written examinations as personally when the examiners sat by the side of the student. It seemed to him that the three technical subjects on which the safety of the public mainly depended were in this arrangement completely frittered away.

Mr. YOUNG agreed very much with what Mr. Greenish had said with regard to the division, and should have preferred subjects which an apprentice could learn during his three years' term, such as practical dispensing, being included rather than theoretical chemistry; but he could not throw away the scheme because this change had been made. At one time he believed that no curriculum or anything else was necessary, and that if a man had knowledge sufficient to enable him to pass the examinations it was enough; but after some years' consideration he had come to the conclusion that a curriculum would really be advantageous to the student, and therefore in his interest he should vote for this scheme. He knew nothing about the legality of the movement, but did not see that there could be much difficulty about it. It was much easier

for a student to come up prepared with three subjects than to come up stuffed with half a dozen, and he had, again and again, in his own neighbourhood, pressed the propriety of doing something to get rid of this concentration which seemed required at a particular time. He rather approved of the interval of twelve months between the two portions of the examination. Under the present system, when a young man passed the Minor he rushed into business at once, before he had gained much experience; but under the new system he would have to wait twelve months and probably most men would take longer, and it would be good for them in the end to do so.

Mr. RADLEY asked if it was intended to do away with what was called the Minor and constitute this the one examination.

The PRESIDENT said that was rather a question of the new Bill. That would be the effect if that Bill passed.

Mr. RADLEY said he was favourable to one examination rather than to two.

Mr. BOTTLE, as a member of the Committee, should have preferred to have given a silent vote and simply endorsed the views of the majority; but as several other members of the Committee had already spoken, he might say a word with regard to his own views. As he had remarked before, he looked upon all legislation as a compromise, and he regarded this scheme in the same light. He regretted that Mr. Hampson had not moved to reject the entire scheme, because if the third, fourth and fifth recommendations were taken out there would be nothing worth having left. With regard to the division of the examinations, one portion was as much qualifying as the other, and he considered it advantageous in this way, that many men at present did not attempt to take up the theoretical portion of their studies during their apprenticeship, thinking that they could get it up in a few weeks afterwards. Under this system a young man might, if he liked to be a little studious during his apprenticeship, get up enough of these three subjects to pass in at a centre convenient to himself. To some extent he shared Mr. Young's regret that practical dispensing was not a portion of the first examination; but that could not be dealt with by a written examination, and, therefore, it was deferred to the final portion.

Mr. HILLS did not think Mr. Bottle's remarks entirely explained the reason for this division of subjects. If the dispensing formed part of the first portion of the examination, he suspected that a cry would be raised that it would be quite sufficient for the needs of the public if a man were fairly up in prescriptions, pharmacy, and practical dispensing. It had been one of the objects of the Committee to impress on the pharmaceutical student that he should be working up some of the scientific subjects quietly in the country while engaged in practical work, and that theoretical chemistry should not be something he could put off until he had passed the first portion—that in fact it should be the basis on which he was undertaking his daily duty. Mr. Borland seemed to think there would be some disadvantages to the student in having a year's interval between the first and second part, and that thus considerable time might be wasted; bnt the candidate might pass the first portion of his examination whilst still in a situation, and not commence certain parts of his curriculum for five or six months subsequently. There seemed to be a little difference of opinion between the mover and seconder of the amendment, for whilst Mr. Hampson said pharmacists at the present time were equal to the occasion, Mr. Williams said they had lost in times past many advantages that they might have had, because they were not up to the mark.

Mr. WILLIAMS said he did not see where the contradiction was.

Mr. HAMPSON asked if the opinion of the Solicitor had been obtained on the legal aspect of the proposal; and supposing the new Bill did not pass, was it contemplated to put this scheme into force.

The PRESIDENT said the opinion of the Committee was that, substantially, these recommendations could be carried out under the existing law; but if they could not in their integrity, it was desirable they should be as far as practicable.

Mr. HAMPSON wished to know whether the Solicitor's opinion had been obtained.

The PRESIDENT said the Solicitor had often expressed some doubts as to the expediency of dividing the examination; but the Committee believed that the Council had as much power to divide the Minor into two parts as it had to have the Preliminary separated from the other portion.

Mr. WILLIAMS said there were many minor points, such as conducting the examinations in the country, which, he thought involved legal questions, and he should like to know whether the Solicitor had been consulted or whether the Committee had acted simply on its own judgment.

The PRESIDENT said the Solicitor had only been consulted as to the division of the examination. As to conducting a part of it in the country that was a question of bye-law. The whole of these matters would have to be incorporated into bye-laws approved by the Council and by the Society at a special general meeting, and then approved by the Privy Council in the ordinary way.

Mr. WILLIAMS said bye-laws could only be made within the limits of the Act of Parliament. It must be obvious to everyone who read the Act of Parliament and the bye-laws that the Council had not power under the present Act to carry out this scheme.

Mr. SCHACHT, in reply, said it did not appear to him that the adoption of the report involved the question of the possibility of carrying it out under the present law or another law. The first thing to arrive at was the course which it was desirable to adopt, and that was the only subject at present before the Council.

Mr. HAMPSON took exception to that view. Part of the report mentioned a time when the scheme was to come into operation, and that was as much a portion of it as any other.

Mr. SCHACHT said he asked the approval of that recommendation. If it were approved, the Council would of course take the best means possible for carrying it out. He had his own opinions about the matter, but did not think it desirable to intrude them on the Council now. The present question was simply whether those were the right principles to adopt in the training of young men for the future, and on that he should have but few words to say in reply, for looking carefully into the objections raised they resolved themselves into a very few points. He did not wish to undervalue their importance, but now and then points had been touched upon which had been already decided in past times. He would therefore not enter into any consideration of the question whether it was desirable that the system of education should be reorganized. The question whether men came up fit or unfit had, in his opinion, been settled. The new points for consideration that day he had before referred to, and on those he would once more say a word, because they had been to some extent attacked. In the first place he would refer to the criticism that any division of the examination was to be estimated as a separation into two examinations. That seemed to him a point not of any great importance, but seeing that it was not so considered in many other cases it might be fairly taken in their own case as a portion of one examination. Many medical examinations consisted of two portions, and some of three. A man studying medicine had to pass two or three examinations, but he did not get the smallest advantage outside the effect on his own training by having passed the first or second; it was not until he passed the final portion that he was credited with being anything else than a student. The advantage of dividing the examination was not only that it cleared away a certain portion of the student's work, but it was calculated to be of the greatest importance in the student's own career

it brought him up at intervals to the position that he was being looked after by a central body and was required from time to time to show he was doing some work, and work which would ultimately qualify him for a vocation in life. At a recent meeting in his own neighbourhood one very sagacious man suggested that it would be extremely useful if the Society could institute an annual examination for all pupils. He did not suggest that it was practicable, but that it would do an immense deal of good to the students. That might be an extreme view, but it was quite correct, and this intermediate or first portion of the examination would have the same effect. It put before a man a point that was not too far off which he had to reach, and then he went on again to a further point, and this would help to keep him systematically and carefully to his work. Supposing the division were admitted, there was an important objection made to the special division proposed, and it had been urged very strongly by Mr. Greenish that the practical subjects should form the first part and the three scientific subjects the last. To that he had always felt the gravest objection. In the first place, if the objection took place at all, the first portion must consist of those subjects in which a student could be examined by a written process, and a man could not be examined as to his capability in dispensing by any written process. A still more important reason in his opinion was, that when a man declared himself, or aspired to be a real dispenser he should not be able simply to put so much into a mortar and make a good pill of it, but that he should know how, from a knowledge of chemical principles, to manipulate properly the materials he was called upon to dispense. He did not think much of a man who was simply capable of mechanically fulfilling the instructions on a bit of paper and sending the result out either as pills or mixtures. If dispensing meant anything, it meant bringing to the compounding of medicine all the intelligence it was capable of, and he would, therefore, take that as the culminating point of the examination. If a man could dispense well, according to his interpretation he could do all the rest, and might pass with the best hall-mark that could be given him. The division he proposed was open to one serious objection, no doubt; they were obliged to include pharmacy. But it only meant a portion of pharmacy, because there were many points of pharmacy about which a candidate should be examined, which could not be well done by a written process, and those he hoped the examiners would see they could take under the heading of materia medica. A great deal, however, could be done in writing, and such portions could fairly be taken in the first part of the examination. The division was, after all, a sort of compromise, the endeavour being to get that portion which could be done by a written process in order that it might be conducted in the country. The scheme now suggested was one which guarded against any possibility of immorality; that was a strong word, but not too strong, for it would be most decidedly immoral to allow anything which could compromise in the slightest degree the absolute *bona fides* of any examination. It was proposed that a member of the Board of Examiners should be present at each examination, the number of centres being limited accordingly, and under that condition he did not see that there could be any objection. With regard to the point raised by Mr. Borland as to the course of five months for botany, that was a point which might be modified at any time. The great point was the security the Council must have that a full and complete system of botanical study should be undertaken by those who taught the students. If the peculiarity of any district, like Scotland, prevented it being carried out in a particular form, he saw no reason why the matter should not be met by special regulation. Again, with regard to the interval between the two portions of the examination, he should be quite willing that the interval should be six months if the model system of training could be secured in all cases, namely, that during the three years' training certain work should be carried on, and then six months should be devoted to practical work in the laboratory. That would be sufficient, and he should be glad to find that that was the course practically adopted in the future. But it must happen that in a great number of cases a small portion of the curriculum only could be fulfilled during the first three years of pupilage; many pupils would be in localities where they could not obtain the instruction required, and then it would be necessary for them to take the whole of their lecture teaching after they passed through their pupilage. In such cases it would be a great misfortune to say it could be done in six months, because it would be nothing less than recommending a system of cram of the worst order. It was from that point of view the Committee said the only escape was to make the interval longer. He regretted that there was not perfect unanimity on this point, and that Mr. Hampson had not continued on the Committee. What was aimed at was nothing but a more complete training of the pharmacist for the future, the difference of opinion being only a question of degree, and he was happy to think the degree was becoming more and more limited in scope.

Mr. BORLAND wished to explain with regard to the courses of botany in Scotland, that there were quite forty-eight lectures given, but they were given in three months instead of in five.

The PRESIDENT said it would be quite open to introduce a modification of the regulations to meet such cases at any future time.

The amendment was then put, with the following result:—

For—Messrs. Hampson and Williams.

Against—Messrs. Andrews, Atkins, Borland, Bottle, Butt, Carteighe, Churchill, Gostling, Hills, Radley, Richardson, Robbins, Savage, Schacht, Squire, Symes, and Young.

Mr. Greenish was present but did not vote.

Mr. WILLIAMS then moved a second amendment to the effect that the paragraph in the report fixing the time when the regulations should come into force should not be adopted.

The amendment not being seconded fell to the ground.

The original motion for the adoption of the report was then put and carried.

THE PHARMACY ACTS AMENDMENT BILL.

The SECRETARY then read the following communications:—

From the Council of the North British Branch containing certain suggestions with regard to the draft Bill, to which it gave a general support.

From Edinburgh, enclosing a resolution passed at a meeting of chemists and druggists held in that city on February 22, to consider the Pharmacy Acts Amendment Bill, to the effect that that meeting gave its cordial support to the Bill. The meeting also recommended that the exemption from jury service should be extended to all persons qualified under the Pharmacy Act who were engaged in business.

From the Chemists and Druggists' Trade Association of Great Britain, dated Birmingham, February 28, enclosing a series of suggested amendments to the draft Pharmacy Bill which were adopted at a meeting of the Executive of that Association held on February 19. The principal recommendation was that the whole of clause 2 should be expunged and that the articles in the special schedule referred to in that clause be added to Part 2, Schedule A, of the Pharmacy Act, 1868. Another suggested amendment was the exemption from jury service of all registered chemists and druggists.

From the Committee of the Registered Chemists' Trade Association of Liverpool, expressing a general approval of the Bill. The Committee suggested that the new technical term "poisonous articles" was calculated to

cause confusion and recommended that the articles comprised under it should be put in a third part of the poison schedule of the Act of 1868 or a "poison schedule" of this Act; also that the usual consideration of existing vested interests should be granted to assistants who have been acting as managers of branch shops for a term of not less than three years previous to the passing of the Act, or who may pass a Modified examination provided for them as "existing managers."

It was resolved that the communications now received respecting the new Pharmacy Bill be referred to the Law and Parliamentary Committee.

REPORTS OF COMMITTEES—*continued.*

BENEVOLENT FUND.

The report of this Committee included a recommendation of the following grants:—

£10 to a former member, aged 76.

£10 to the widow of a member who has had two previous grants.

£5 to the widow of an associate.

£10 to the widow of a registered chemist and druggist, who has had two previous grants.

£21 to be placed in the Secretary's hands to be expended at his discretion in getting an orphan into an asylum.

£10 to a fund being raised for the seven orphan children of a registered chemist and druggist.

The death of two of the annuitants was reported.

The report and recommendations were received and adopted.

Junior Pharmacy Ball.

The SECRETARY announced the receipt of twenty guineas for the Fund from the Committee of the Junior Pharmacy Ball.

LIBRARY, MUSEUM, LABORATORY, AND HOUSE.

Librarian's Report.

The report of the Librarian had been received, and included the following particulars:—

Attendance.		Total.	Highest.	Lowest.	Average.
January	Day	572	33	7	27
	Evening	157	20	3	7

Circulation of books.	No. of Entries. Town.	Country.	Total.
January	184	137	321

Carriage paid, £1 14*s.* 10*d.*

The undermentioned Donations to the Library had been received, and the Committee recommended that the usual letter of thanks be sent to the respective donors:—

Papers relating to the administration of the Dentists' Act. From the BRITISH DENTAL ASSOCIATION.

Parey (A.), Workes, 1649. From Mr. W. V. RADLEY.

Plugge (P. C.), Über Andromedotoxin, den giftigen Bestandtheil der Andromeda Japonica, 1883. From the AUTHOR.

The Committee recommended that the undermentioned work be purchased for six months:

Knowledge, conducted by Richard A. Proctor. 2*d.* weekly.

The Committee recommended that certain volumes and numbers of the *Pharmaceutical Journal*, to complete the set belonging to the Chicago College of Pharmacy, be presented to the College.

Curator's Report.

The Curator had reported the attendance in the Museum during January to have been:—

	Total.	Highest.	Lowest.	Average.
Morning	445	34	3	17
Evening	104	14	0	5

The following Donations to the Museum had been received, and the Committee recommended that the usual letter of thanks be sent to the respective donors:—

Leaves of *Eucalyptus globulus*, from the plant which yielded the oil previously presented From Messrs. WARRICK BROTHERS.

Seeds of *Pterocarpus Guianensis.* From Dr. H. E. CAUTY, Liverpool.

Roots of *Tephrosia macropoda*, *Sium Thunbergii*, *Chlorocodon Whitei*, Bark of Isibaha, and three bottles of Aloe Juice obtained from African species cultivated in the Botanic Gardens at Natal. From the Curator, Mr. J. M. WOOD.

Specimens of Naphthaline and Naphthol. From Messrs. DOMEIER and Co.

Specimens of *Casca amarga* Bark, and of the Barks of *Croton Pseudo-china*, and of an unnamed species of Croton. From Messrs. CURLING and Co.

Specimen of the Bark of *Vateria Indica.* From Dr. ONDAATJE, Ceylon.

Herbarium Specimens of Damiana. From Messrs. PARKE DAVIS and Co.

The following letter had been received:

"Botanical Department,
"Gordon Town, P.O.,
"Jamaica, 22 *January*, 1883.

"Sir,—In accordance with the request received from the Pharmaceutical Society of Great Britain for specimens of Cinchona under cultivation on the Government Plantations in Jamaica, I have pleasure in forwarding a set as described on the accompanying notes, which leave by this mail to the care of J. F. Obree and Co., Southampton.

"Messrs. Obree and Co. are instructed to forward the box containing the specimens addressed to the Curator of the Museum of the Pharmaceutical Society, together with a memorandum of expenses incurred in transit.

"I may mention that the specimens are presented to the Pharmaceutical Society by the Government of Jamaica, and they have been prepared and packed with great care. All the specimens of leaves, flowers, fruit and bark of each kind are taken from one tree, so that the sets are complete in themselves and thoroughly representative of the plants under cultivation in this Island.

"I have the honour to be, Sir,
"Your obedient servant,
(Signed) "D. MORRIS.
"Director, Public Gardens and Plantations.

"The Secretary,
"Pharmaceutical Society of Great Britain,
17, Bloomsbury Square, W.C."

The Curator had reported that the specimens referred to had arrived in excellent preservation, and were all that could be desired. Each species was represented by specimens of the root, trunk, branch, and twig bark taken from the same tree as the herbarium specimen. The latter showed the fruit and flower in each stage, and the whole formed a most valuable and instructive series.

The PRESIDENT had reported that on consultation with the Solicitor and several members of the Council, it appeared that in order to give the Council power to elect Corresponding Members of the Society the bye-laws would have to be amended; and it was recommended that a suitable bye-law should be drafted for the purpose at the earliest opportunity.

The Professors had attended and reported satisfactorily of their respective classes.

It was recommended that the front of the house be painted with one coat, and that the second-floor windows in Great Russell Street be made to correspond in appearance with those facing Bloomsbury Square.

The report and recommendations of the Committee were unanimously adopted.

THE CONVERSAZIONE.

This Committee reported that similar arrangements were being made to those of former years. The report was received and adopted.

SPURIOUS AND WORTHLESS DRUGS.

This Committee presented the following report:—

Report of the Committee on the Sale by Auction of Spurious and Worthless Drugs,

Consisting of the President, Vice-President, Messrs. Greenish, Hampson, Richardson, Symes, Williams, Woolley, Young (*Members of Council*), and Messrs. Fredk. Barron, Richd. B. Barron, T. Farries, G. Bult Francis, J. B. Herring, Wm. Hodgkinson, E. M. Holmes, Edw. Horner, C. Umney, F. Yates, Professor Bentley and Dr. Paul.

Your Committee has had several prolonged meetings and obtained much information on the subject from various sources. It has also received many suggestions from other members of the wholesale and export trade.

Your Committee begs to report the following general conclusions which have been arrived at after much careful consideration of the facts brought before them and mature deliberation thereon.

1. The importation and sale of adulterated as well as spurious and worthless drugs does not appear to be on the increase. This fact is probably in part due to the greater skill now possessed by wholesale dealers and pharmacists as a result of the advances made during recent years in the physical, chemical and microscopical examination of many drugs. Effectual means of detecting sophistication and distinguishing the genuine from the spurious have been thereby placed at the disposal of importers and wholesale and retail dealers of drugs.
2. That a few adulterated and spurious drugs, belonging to a small class not easily assayed or tested by chemical methods, occasionally find their way into commerce is undeniable; but occurrences of this kind do not appear to be so frequent as to require special powers to deal with them, beyond those already to be found in the existing law.
3. With a view of preventing as far as possible the importation and distribution of adulterated, sophisticated and spurious drugs, it seems desirable that the Council should annually appoint a standing committee, whose special duty it should be to receive information regarding such drugs, collect specimens and have them carefully examined. A report of the results of its labours should be published periodically in the pharmaceutical press.

The report was unanimously received and adopted.

Appointment of a Standing Committee.

The PRESIDENT moved that the Standing Committee referred to in the third paragraph consist of the present members of the Council acting on the Committee, and that at their first meeting they proceed to elect some members of the wholesale trade to act with them.

Mr. WILLIAMS thought it would be more satisfactory to the members of the wholesale trade if they were invited to assist the Committee in rotation, not limiting it to any one section, but appointing four or six members year by year.

The PRESIDENT said he thought the best way would be to move that the members of Council now on the Committee be reappointed a standing committee with power to add to their number. They would, no doubt, bear in mind what had been suggested.

This was agreed to.

GENERAL PURPOSES.

The report of this Committee mainly consisted of the Solicitor's report as to cases which had been placed in his hands. From this it appeared that—

Mr. Hustwit, 19 and 20, Market Street, Darwen;
R. Newman, jun., and Co., 13, Market St, Darwen;
E. C. Lewin, 7, Whimple Street, Plymouth; and
H. W. J. Ince and Co., Market Place, Dudley,
had severally paid £5 penalty and costs.

Several cases of alleged infringement of the Act had been considered by the Committee, and in some of them it was recommended that proceedings be taken.

The report and recommendations of the Committee were unanimously adopted.

REPORT OF EXAMINATIONS.

February, 1883.

ENGLAND AND WALES.

	Candidates.		
	Examined.	Passed.	Failed.
Major (21st)	3	2	1
,, (22nd)	4	1	3
,, (23rd)	4	2	2
	— 11	— 5	— 6
Minor (21st)	29	7	22
,, (22nd)	27	8	19
,, (23rd)	28	13	15
	— 84	—28	—56
	95	33	62

Preliminary Examination.

Nine certificates had been received in lieu of the Society's examination:—

1 College of Preceptors.
7 University of Cambridge.
1 ,, Oxford.

THE ANNUAL REPORT.

It was resolved that the preparation of the Annual Report be referred to the Library, Museum and Laboratory Committee.

EVENING MEETING.

Wednesday, March 7, 1883.

MR. MICHAEL CARTEIGHE, PRESIDENT, IN THE CHAIR.

An Evening Meeting of the Pharmaceutical Society was held on Wednesday last, March 7. The chair was taken at half-past eight o'clock.

The minutes of the previous meeting having been read and confirmed, the President read a paper on—

OLEATE OF URANIUM.

BY WALTER GIBBONS.

The paper is printed on p. 737, and gave rise to the following discussion:—

The PRESIDENT said that although oleate of uranium was not a sufficiently stable compound to come into use to any great extent, still it was interesting to find that such compounds could be prepared; and it was gratifying to find that one of the members of the Society took sufficient interest in the subject to make a complete analysis of this body.

Mr. POSTANS said that if Mr. Gibbons could have produced a stable preparation there would have been some chance of its being tried for medical purposes. He believed that if the salts of uranium were brought into use, the nitrate of uranium would be the best and most easy of manipulation, and he had found it perfectly soluble in almost all proportions in glycerine. Probably the solution in glycerine would keep exceedingly well. It was opportune that Mr. Gibbons should have brought this subject before the Society at the present moment, there being a paper which seemed to run almost concurrently with his note, and which was published in the current number of the *Journal of the Chemical Society*. It contained investigations which Dr. Arthur Smithells had undertaken at the suggestion of Professor Roscoe. At present there was no medical evidence as to the usefulness of salts of uranium.

A vote of thanks was accorded to the author of the paper.

The next paper read was on—

Liquid Extract of Cinchona.

BY B. H. PAUL, PH.D.

Dr. Paul introduced the paper by remarking that the liquid extracts constitute a class of preparations which have found especial favour with medical men in America, and that the new edition of the United States Pharmacopœia contained formulæ for no less than seventy-seven liquid extracts, or nearly double the number that were contained in the previous edition. The advantages claimed for these preparations were, first, that they present the active constituents of drugs in that particular state of combination and association in which they occur naturally; secondly, that they ensure complete exhaustion of the active principles of drugs by the selection of menstrua suitable for holding them in permanent solution and presenting them in a concentrated form. Among the defects of these preparations, one of the principal, which they shared with other galenical preparations, was variation in strength, consequent upon the variability of the crude drugs used in making them, and though in British pharmacy they were less numerous than on the other side of the Atlantic, some of them would admit of being considered from this point of view.

The paper is printed on p. 737, and gave rise to the following discussion:—

The President said that the paper was essentially a practical one, and it had both a pharmaceutical and a medical aspect. Some advanced pharmacists and young medical practitioners thought that preparations of bark were a mistake, and that it was better to use the active principles in definite proportions. On the other hand there was, perhaps, a larger number of medical men who had to think of the best way of curing disease, and who did not set about it with any preconceived theory, but who looked to results. These men alleged that certain good results followed from the use of preparations of the crude drugs. Certainly when Mr. Battley introduced fluid extract of cinchona his intention was to place in the hands of medical men a preparation which should contain the active principles as they existed in the drug.

At the invitation of the President to address the meeting—

Dr. Duckworth said that he had been very much enlightened by the paper. He must at once acknowledge that he had always conceived the Pharmacopœia preparation to be a very good one, and he believed that it took the place of one that was once largely used, namely, the liquor cinchonæ, which he confessed he had not prescribed ten times in his life. But he was bound to say that he had not used the Pharmacopœia preparation as much as he had used two other preparations of bark, namely, tincture of yellow bark and the old compound tincture of bark. He always made use largely of decoction of cinchona. One came to know the tools with which he worked from day to day, although some persons scoffed at experience which was gained in that way. He did not decry the methods of investigation employed in the physiological laboratory, but he believed in the correct observations of the effects of what he was not ashamed to call empirical preparations. He was bound to say that he should, in future, think much less of the preparation to which the paper related than he had thought of it hitherto. His dear old master, Sir George Burrows, taught him to use this preparation in conjunction with quinine, and defined very clearly the cases in which one or other or both of these medicines should be employed. In certain cases of disease of the throat, Sir George Burrows held that a mixture of the two was more useful than either given alone. He was sure that the medical profession was very much indebted to Dr. Paul for enlightening them on the subject of the preparation in question. Medical men would be willing to attribute to quinine all the credit which belonged to it, and to allow that it would do work which no other preparation would accomplish; but yet in the preparations of bark there were virtues which they might suppose to be due to other substances which were present in those preparations in addition to quinine. He thought that it might be said that there were forms of pernicious malarial fever which even that grand alkaloid quinine was not of itself able to meet, and in which the preparations of bark would produce good results. He was sure that the profession would continue to use the preparation of the crude drugs, and would refuse to be tied up to the use of the pure alkaloids.

The President said that it would be fitting that he should ask Professor Redwood to give them his views of the *raison d'être* of the process given in the Pharmacopœia and to state how it came to pass that a preparation of the kind in question should have become official.

Professor Redwood stated that the introduction of fluid extract of bark into the Pharmacopœia did not originate with him, and he thought that he might fairly say that the preparation did not originate even with the pharmacists or the medical men of this country. Sixty years ago he was practically engaged in pharmacy, and he could remember a preparation of cinchona bark which was in use at that time, and which bore a very close resemblance to that which was under discussion. It was a preparation made in accordance with the French Codex. It was employed under the name of "essential salt of bark," and was prepared by making a cold infusion of bark and evaporating it, filtering towards the end of the process, and then spreading the filtrate out on plates of glass, upon which it scaled somewhat like ordinary scale preparations. It was perfectly soluble in water and was an approved article in medicine. Similar preparations had been introduced since. One was included in the London Pharmacopœia in 1851, and it passed from the London Pharmacopœia to the British Pharmacopœia. It was a preparation which was also recognized in the Pharmacopœia Germanica. It was obvious that there had been for a great length of time a belief in the efficacy of an aqueous extract of bark. It was true that extracts of bark in a concentrated form had varied in their nature from time to time, but all the authorities that he had referred to had ordered very concentrated preparations, the essential salt of bark being in the solid state. The exhaustion of the bark was effected by water, though in some cases, as in the process given in the British Pharmacopœia, a little spirit was added at the end of the process after concentration. He looked upon the communication which had been read by Dr. Paul as a very important and very valuable one, and having been brought forward by a gentleman so competent as Dr. Paul it necessarily called for a great deal of investigation; but still he must say that he was disappointed at the manner in which the author had treated the subject. The paper contained too many assumptions, some of which were obviously erroneous. This very much damaged the value which the paper would in other respects possess. The first assumption was that flat calisaya bark was ordered by the British Pharmacopœia in the preparation of the liquid extract. He would ask Dr. Paul where he found anything to that effect in the Pharmacopœia. At the time the Pharmacopœia was published, flat calisaya bark, which readily yielded 2 per cent. of quinine without other alkaloids, was an article of commerce which could be easily obtained. The Pharmacopœia in defining the yellow calisaya bark said that it was "in flat pieces, uncoated, rarely in coated quills." It was true that calisaya bark was ordered, but flat calisaya bark was not exclusively ordered; and he gathered from Dr. Paul that flat calisaya bark was an article rarely met with in commerce now. There was an article which resembled it, and which perhaps Mr. Holmes could hardly distinguish, but that was not the article of the Pharmacopœia. Dr. Paul stated, however, that quilled calisaya bark, which was equally the article ordered in the Pharmacopœia, could be obtained of good quality and in any quantity. The second assumption made by

the author was that the efficiency of the process of the Pharmacopœia might be tested and judged of by referring to something which had been produced by materials such as were not ordered in the Pharmacopœia. The material used by Dr. Paul in making the extract in one set of experiments was a spurious bark which was obviously not calisaya bark at all, for it contained scarcely any quinine, and it contained an abundance of alkaloids which were not present in the true calisaya bark. The other set of experiments was made with a bark which the Pharmacopœia did not order, namely, Indian bark, which he believed differed from calisaya bark in an essential feature, namely, the proportion of cinchotannic acid which was present in it, and which rendered the quinine and the alkaloids in the bark less easily extracted, and less soluble in water than they would be otherwise. The third assumption of which he complained was that the preparation in question, and perhaps other preparations also, were intended fully to represent the medicinal properties of the drugs from which they were prepared. This was expressed or implied in different terms in different parts of the paper. He was quite prepared to hear that those who had written upon the subject—Mr. Battley, for instance—had said something to the effect that the preparation in question was bark, minus woody fibre, and that it might be looked upon as containing all the medicinal value of the bark. He asked what ground there was for assuming that the authors of the Pharmacopœia adopted any such view. Perhaps there would be no difficulty in showing that in scarcely any of the preparations of the Pharmacopœia were the drugs completely exhausted of their active principles, and perhaps in a great number of instances the very object was to take out only a small quantity of these principles. Taking, for instance, such a preparation as infusion of chamomile, who in his senses would think of objecting to that infusion because it did not fully represent all that was active and efficacious in the chamomile? In his opinion the objection that extract of bark did not fully represent the whole of the active matters contained in the bark was a very weak objection to urge against it. Twenty years ago he sat upon a Committee of the Society for the revision of the London Pharmacopœia, and at that time he made some experiments at the request of the Committee with reference to some of the preparations of bark, especially decoction. Dr. Paul stated in his paper that a decoction of Indian bark contained no more than one-fourth or one-fifth of the alkaloids of the drug. He (Professor Redwood) made his experiments, not with Indian bark, but with the bark ordered in the Pharmacopœia, namely, calisaya bark, and he found that a decoction made strictly as the Pharmacopœia indicated contained nearly one-half of the alkaloid. A pint of the decoction made from 1¼ ounces of the bark contained 6·25 grains of quinine, and in the residue of the bark 7·8 grains of quinine could be subsequently taken out. A ¼ of a grain of the quinine in the decoction deposited with the precipitate, which formed as the decoction cooled. This instance went to show the weakness of that mode of judging the efficacy of the Pharmacopœia preparations which was founded upon experiments with materials which were not ordered in the Pharmacopœia. Good calisaya bark was a quinine bark containing a certain quantity of cinchotannic acid, which rendered the quinine only slightly soluble, but it contained other substances, such as kinic acid, in combination with which quinine was soluble. It yielded by decoction or infusion a larger quantity of quinine than the Indian bark such as Dr. Paul had used. Although the Indian bark contained the same proportion of quinine, yet there was something present in it—probably a larger proportion of the astringent matter or cinchontannic acid—which rendered the quinine less soluble in that kind of solvent. In answer to the President, Professor Redwood added that he had not determined the amount of total alkaloids in the fluid extract. He was prepared to find that there was some deficiency as regarded the alkaloids, but he and the medical men with whom he had had the honour of acting in connection with the British Pharmacopœia considered that there was great efficacy in the extract independently of the alkaloids. Probably there were aromatic and resinous matters taken up and retained in the aqueous preparations.

Mr. Umney said that he had always looked upon the fluid extract of cinchona contained in the Pharmacopœia as a continuation of a preparation which was originally brought before the College of Physicians by Richard Battley, about the year 1830. In the London Pharmacopœia of 1851 there were preparations known as infusum cinchonæ spissatum, made from both loxa and calisaya barks; that from calisaya bark was continued in the British Pharmacopœias. He considered that the pharmacy of cinchona bark at the present day was in a great muddle. He was aware that quilled calisaya bark could be obtained, but it certainly did not come up to the standard of former years either in quality, as far as its quinine assay was concerned, or in quantity. Flat calisaya bark was offered weekly at public auctions which did not contain a trace of quinine. He did not know what would happen one day with respect to this substance when druggists found themselves face to face with the Sale of Food and Drugs Act. Every one knew calisaya bark was a very difficult thing to even partially exhaust with water. He generally employed a series of percolators, each of which contained a certain amount of bark, and he was in the habit of passing the percolate from one to the other. The Pharmacopœia was in fault with regard to the specific gravity of the preparation, which instead of being 1·100 was 1·120, provided the proportion of spirit directed was added to the evaporated extractive having a specific gravity of 1·200. The yield of fluid extract also was somewhat overrated in the Pharmacopœia. His own experience was that one could never get more than about 20 per cent. of completed fluid extract from flat calisaya bark or more than 22 per cent. from quilled calisaya bark. He had not used either flat or quilled calisaya bark for the Pharmacopœia preparation for years. He had used Indian *Cinchona officinalis*, containing probably 3 to 5 per cent. of quinine, and this bark would yield sometimes upwards of 40 per cent. of completed extract. A very good bark which came into commerce in enormous quantities was known as soft Columbian bark. Although it contained fully the quantity of quinine ordered in the Pharmacopœia, namely 2 per cent., still it contained no extractive matter at all, and was ill adapted for the preparation of liquid extract.

Mr. Ekin said that in a paper which he had read before the Pharmaceutical Conference some years ago, he went over somewhat the same ground as Dr. Paul. He took a bark sold as flat calisaya bark which contained about 2 per cent. of quinine and made the preparations with it. The bark was almost entirely exhausted by the tincture. The infusion was next richest, and then came the decoction, which so far as he could remember contained about half the total alkaloids contained in the bark. With regard to the inspissated infusion it was quite possible to follow the directions of the Pharmacopœia and yet not get more than 20 per cent. of fluid extract; but sometimes more was obtained, for if the bark was very rich in quinovic acid an infusion would be obtained which when concentrated would give a much larger yield, sometimes as much as 50 per cent. of a fluid extract having the required specific gravity and which of course would be to a corresponding extent poor in alkaloids; yet, in a case of this sort if it were attempted to concentrate the infusion from a pound of bark to 3 ounces as ordered by the Pharmacopœia, they would get an almost solid extract. Dr. Paul, in his paper, had omitted any mention of the way in which he estimated the alkaloids. It would be interesting if he would give the

details of his method, as some present might like to repeat his experiments.

The PRESIDENT said that, with all respect to what Professor Redwood had said, it appeared to him that the object of the paper was to show the action of water upon such cinchona barks as were now commonly met with in commerce. It was no answer to the paper to say that if they took such barks as were obtained many years ago different results would be obtained. The paper showed the action of water upon two very well known specimens of bark, namely, flat calisaya bark so-called, which was rather poor in alkaloids, and Indian bark, which was rather rich. Pharmacists had imagined that they had a very potent preparation of cinchona bark in the fluid extract, and the paper seemed to him to prove that such was not the case.

Dr. PAUL, in reply, said that his object in appearing before them with the paper was not to speak as a pharmaceutical professor and ask them *ex cathedrâ* to accept assumptions of any kind, whether well or ill founded. The main object of the paper was to raise a question as to what was required in a preparation of bark such as the liquid extract, so that, having arrived at a knowledge of what was desired from a medical point of view, chemical and pharmaceutical skill might be applied in obtaining it. He had, however, been charged by Professor Redwood with venturing upon assumptions which were entirely erroneous, and he would, therefore, address himself to answering that charge. First he was said to be wrong in assuming that the bark known as "flat calisaya" was the bark of the Pharmacopœia. In reply to that, he would only refer to the description given in the Pharmacopœia in the following words:—"Characters: In flat pieces uncoated or deprived of the periderm, *rarely in coated quills.*" If that did not mean that the flat bark was essentially the bark to be used for pharmaceutical purposes, he did not understand the English language. As regarded the second alleged assumption, it was true that the experiments in the paper referred to bark which was not official, but in the one case he had operated upon such a bark as was obtainable under the name of "flat calisaya" at the present time, and in the other case upon one which contained the same amount of quinine as the official bark should do. He had shown that the process given in the Pharmacopœia failed to extract the alkaloids in both cases, and that was precisely the point which raised the question as to what was the object of the liquid extract. Was it to represent cinchona bark in reality, or was it to be merely an astringent preparation with the cinchona alkaloids left out? He had certainly adopted the view that this preparation ought to represent the whole of the medicinal properties of cinchona bark in a concentrated form, but was that an erroneous assumption, as Professor Redwood contended? In order to justify himself on this point, so far as pharmaceutical opinion was concerned, he would refer to the original paper read in the year 1838 before the College of Physicians by Mr. Battley, who said, "I have arrived at the conclusion that the desideratum in pharmaceutical chemistry is to leave unchanged the medicinal qualities of the substance acted upon, separating and removing therefrom, as far as may be possible, every matter not possessing remedial virtue." Then Mr. Battley went on further to say, with special reference to liquid extract of cinchona bark, that his process had the effect of separating and securing nearly the whole of the medicinal properties of the bark. There was, indeed, no doubt that was the object which Mr. Battley had in view, and according to the light of the chemistry of that day Mr. Battley supposed he had attained it. He (Dr. Paul) believed that he had shown conclusively that, whatever kind of bark was used, the result of operating upon it with cold water was that material, time and labour were wasted, and the result arrived at was a fiasco. The data given in the paper showed that the poorer the bark the better, proportionately, was the result. He found it to be a notorious reproach that the process given in the Pharmacopœia for making liquid extract of cinchona was utterly bad. He read in one place that the process was "exceedingly wasteful," and that the bark after being operated upon was as good for quinine making as it was before. Another writer said that there was "no efficient formula in existence" to represent cinchona bark, though that was a great desideratum, and that some means of arriving at a preparation which should be justly represented as "bark minus the woody fibre" had yet to be attained. He therefore thought that the meeting would absolve him from having been regardless of pharmaceutical authority and pharmaceutical considerations and admit that he had been guided at any rate by common sense, if not by such long experience as Professor Redwood was able to command. In regard to the results he had obtained in making the decoction and the infusion of cinchona, referred to incidentally for the purpose of comparison with the liquid extract, Professor Redwood's objection that they had been obtained by operating upon Indian bark did not hold good; for he had not only used for this purpose Indian bark, and such as was to be had under the designation of "flat calisaya" bark of the Pharmacopœia, but he had prepared the decoction and liquid extract from the quilled calisaya, which was the exceptional kind of the Pharmacopœia, and he found the results just the same as those obtained with other kinds of bark. The decoction contained about $\frac{1}{4}$, and the liquid extract $\frac{1}{7}$ of the alkaloid present in the bark. The exhaustion was only very partial. He did not think that it was possible to exhaust the bark thoroughly with cold water; and he regarded the indication afforded by the specific gravity of liquid extract, which was stated in the Pharmacopœia to be a guide as to the volume to which the extract was to be brought, as fallacious in so far as it was used to judge of the extent to which a liquid extract really represented the bark it was made from. Specific gravity was no indication of what was present in solution. That might be gum or starch, or cinchotannic acid or anything. What he considered to be required was a knowledge that the preparation contained a definite and uniform proportion of medicinal constituents. Mr. Ekin's reference to the paper he had read before the Pharmaceutical Conference led him (Dr. Paul) to say that he had not been able to confirm the results which Mr. Ekin obtained. Mr. Ekin represented that he obtained from a bark containing nearly 2 per cent. of quinine a tincture equivalent to 100 grains, which contained nearly $1\frac{9}{10}$ths of a grain. He had not been able to obtain such a degree of extraction in making tincture of Cinchona, but, on the contrary, had found that when he repeated the Pharmacopœia process on the same bark, he got a result nearly as good the second time as the first in regard to the proportion of alkaloids. With regard to the liquid extract he found a certain amount of agreement between Mr. Ekin's results and his own, but Mr. Ekin's results were somewhat less favourable to the liquid extract.

The PRESIDENT, in closing the discussion, said that the meeting would, he was sure, accord a hearty vote of thanks to Dr. Paul for his valuable paper.

A note by Mr. Morris on "The Cultivation of Cinchona in Jamaica" was submitted by Mr. Holmes. The paper, which will be printed in a future number, was accompanied by a considerable collection of illustrative specimens.

Mr. HOLMES called attention to some other specimens which were exhibited on the table. Among these were naphthaline and naphthol, new remedies recently introduced in the treatment of skin diseases. There was also a specimen of the very curious body known as paraldehyde, which had lately been described in the *British Medical Journal* (February 3, p. 215) as a new hypnotic,

possessing the advantage over chloral of strengthening the action of the heart. The specimens of pure aldehyde, aldehyde ammonia and aldehyde resin had been sent at the same time by Mr. Williams to illustrate some remarks which he had intended to make, but he was unable to be present. In his absence, he might say that paraldehyde had the formula $C_6H_{12}O_3$, and might be regarded as three molecules of aldehyde grouped into one, the formula of aldehyde being C_2H_4O. The vapour density of paraldehyde was three times greater and the boiling point more than three times higher than that of aldehyde. It was very remarkable, therefore, that this body differed entirely in its chemical, physical and therapeutical properties from aldehyde. Thus aldehyde formed with ammoniacal gas the crystalline compound aldehyde ammonia, and when mixed with alcohol and heated with caustic potash formed aldehyde resin; but neither of these substances was formed by paraldehyde, nor had it the power of reducing nitrate of silver like aldehyde. Paraldehyde had an odour resembling that of acetal, and was soluble in about 8 parts of cold and less of hot water, while aldehyde possessed a very suffocating odour, and was freely miscible with water and alcohol in all proportions. Yet the same substances which cause the molecular changes by which paraldehyde is produced will, at a lower temperature, give rise to the very different crystalline body, metaldehyde. The difference in therapeutical properties caused by slight molecular changes must be a subject of great interest to medical men. The group of aldehydes also possessed a considerable importance from the point of view of botany and materia medica, since they were intimately connected, as recently shown by Messrs. Cross and Bevan, with the formation of vegetable products and with the changes that take place in the tissues of plants, which appear to be largely due to the facility with which aldehyde forms polymeric bodies, the ease with which they are decomposed and the readiness with which they form compounds with other bodies. There was also a specimen of the cayenne pepper pods from Natal, which produced the bright red cayenne pepper so much prized in commerce.

The PRESIDENT said that the specimens of cinchona from Jamaica were sent, in answer to an application made by the Society to the Colonial Office, by the director of public gardens and plantations in Jamaica.

After the conclusion of the business Mr. J. C. Shenstone exhibited a new arrangement for securing the stoppers of poison bottles.

The meeting was adjourned to Wednesday, April 4.

Errata.

Page 724, col. 1, line 32 from top,—

For Capper, Fred. William Noad,

Read Clark, Fred. William Noad.

In the Local List of Subscriptions to the Benevolent Fund, published in the Journal for February 24, the name of Mr. T. D. Walker, of Dresden, Staffordshire, should have been included under "Longton," instead of under "Stoke-on-Trent."

In the same List, on p. 715, under "Walton-on-Thames," *for* "Power, Edward, 5*s*.," *read* "Power, Edward, 10*s*."

Asinus post prand.—We hope that in reading the Bill carefully through you will be able to find an answer to your question.

F. A. Barritt.—We would suggest your further consideration of the clause referred to, and have no doubt you will then perceive that it gives no such permission as that you deprecate.

Cyrmo.—(1) The quinine is soluble in the quantity of dilute sulphuric acid ordered, and will not crystallize out. The solution being a clear one a "shake the bottle" label is not required. (2) Certainly, but the phosphate of iron must be recently precipitated and moist. (3) Dissolve the ammon. hydrochlor. in water to saturation, add a little mucilage, and then the tinct. guaiac. vol. so as to form an emulsion.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

THE DRAFT PHARMACY ACTS AMENDMENT BILL.

Sir,—*Post tenebras lux.* At last, the forced inaction which has been our lot in relation to pharmaceutical politics may be thrown off. Our leaders have sounded the note to prepare for an immediate advance, and we cannot too soon make up our minds to take a share in the work that has to be done.

But, is this work laudable? Personally, I can offer the most cordial approval to the new Pharmacy Bill, now sanctioned by the Council of the Pharmaceutical Society. If it has been laid down upon lines consistent with its greatest chance of "viability," and if it will ameliorate several of the anomalies of the existing Act, giving greater effect to the contract made by the State in 1868, so that unqualified persons shall not usurp the functions of those who have complied with the law, then, on all the principles by which prudent men regulate their actions, we shall give the new Bill a hearty support.

The "heckling" to which the Bill has been subjected should largely increase the confidence of its authors in its soundness. And it is a hopeful circumstance that the public criticism of the measure has been generally conceived in a friendly spirit. Any faults of the Bill are now known, and since the explanations which have been given of the "necessity which has no law," I believe that very little adverse criticism will be accepted as having hit the mark. There is wisdom in the proverb that "Bad wine makes good vinegar." Judging by the quality of the adverse critics' vinegar, I feel that they have not operated on bad wine in dealing with this Bill.

Some of the suggestions thrown out will undoubtedly prove useful contributions to the finished measure. I will venture to add one for what it may be worth, viz., that articles in clause 2 should be labelled either "poisonous" or "poison." As "the greater includes the less," the pharmacist would find it more convenient to fulfil his duty by using the label which at present covers the sale of scheduled "poisons."

Mr. Sandford's remarks upon clause 4, making the retailer of patent medicines responsible for proper labelling in case of their containing a legal poison, will be sure to receive careful attention. But, so far as the labelling of the outer wrapper is concerned, the retailer can be in no difficulty as to what he is selling, for the presence or absence of the poison label will be literally "patent" to his vision.

The Council have deserved our hearty support. Let them have it ungrudgingly.

Leeds. RICHARD REYNOLDS.

B.—The main decomposition results in the formation of iodide of ammonium, and if the iodine be in excess iodide of mercury is also formed.

O. M., Honiton.—The iodide of iron should be dry and the carbolic acid in crystals; crumb of bread will then do as an excipient.

T. Martin.—A dispenser may amend the excipient to retain in their integrity the remedial agents of the prescription. Cacao butter is a good excipient for permanganate of potash; if the mass be too crumbly, add a little vaseline to it.

Joseph.—It was correct to use the ol. junip. pyrolig., which is synonymous with "huile de cade." It is usually a dark empyreumatic oil, but samples may differ.

Pharmacien.—The difficulty in filtration sometimes arises from the rhubarb being powdered, instead of being sliced or bruised, as directed in the B.P.

F. W. W.—As the properties of the ingredients in the mixture are well known, there ought to be little difficulty in devising a scheme for separating them.

COMMUNICATIONS, LETTERS, etc., have been received from Messrs. Kingzett, Allen, Forrest, Wilkinson, Wells, Southwell, Hocken, MacEwan, Hicks, Tanner, Fowler, Gibbons, Page, Newsholme, Lacy, Hannah, Coates, Lloyd, Devoniensis, Labiatæ.

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Adult dose: 6 to 10 daily.

2.—Ipecacuanha. Are readily taken by children. These pastilles are of the same strength as the B.P. lozenges.

3.—Morphia and Ipecacuanha. ($\frac{1}{40}$ grain Morph., and $\frac{1}{4}$ grain Ipecac.)
Adults may take 1 every two, three, or four hours.

4.—Compound Morphia and Ipecacuanha. A more active remedy than No. 3. ($\frac{1}{40}$ grain Morph., $\frac{1}{5}$ Ipecac., $\frac{1}{5}$ Squill, &c.)
For adults, 1 every two, three, or our hours.

5.—Opium and Belladonna. An agreeable substitute for the Troch: Opii B. P., and of the same strength.

6.—Aconite. Each Pastille equivalent to half a drop of the B. P. Tincture.
Adult dose: 1 every two, three, or four hours.

7.—Compound Camphor or Voice.
Adult dose: from 3 to 6 or 8 at intervals during the day.

8.—Chlorate of Soda. May be taken whenever the throat is uneasy.

9.—Lithia. An agreeable mode of taking this alkali. Each pastille contains 1 grain.
Dose: from 5 to 10 daily.

10.—Benzoated Voice. Useful to public speakers, &c. Less active than the Compound Camphor, No. 7.

11.—Chlorate of Potash. A more agreeable form than the lozenge of the Pharmacopœia.
Dose: 6 to 12 daily.

12.—Chalybeate. (Pastilli Ferri., A. & H., 1 grain Citrate of Iron.) An agreeable form of lozenge, readily taken by children.
Dose: 3 to 12 daily, according to age of patients.

13.—Rhatany. Astringent.
Dose: 6 to 12, daily, at intervals.

14.—Tannin. Astringent, and of the same strength as the Troch: Acid: Tannic: P.B., and they may be taken to the same extent as No. 13.

15.—Carbolic Acid. ($\frac{1}{2}$ a grain in each.)

16.—Bromide of Ammonia. (1 grain in each.)

17.—Chlorate of Potash and Borax. (1 grain of each.)

18.—Borax. (2 grains in each.)

19.—Chloride of Ammonium.

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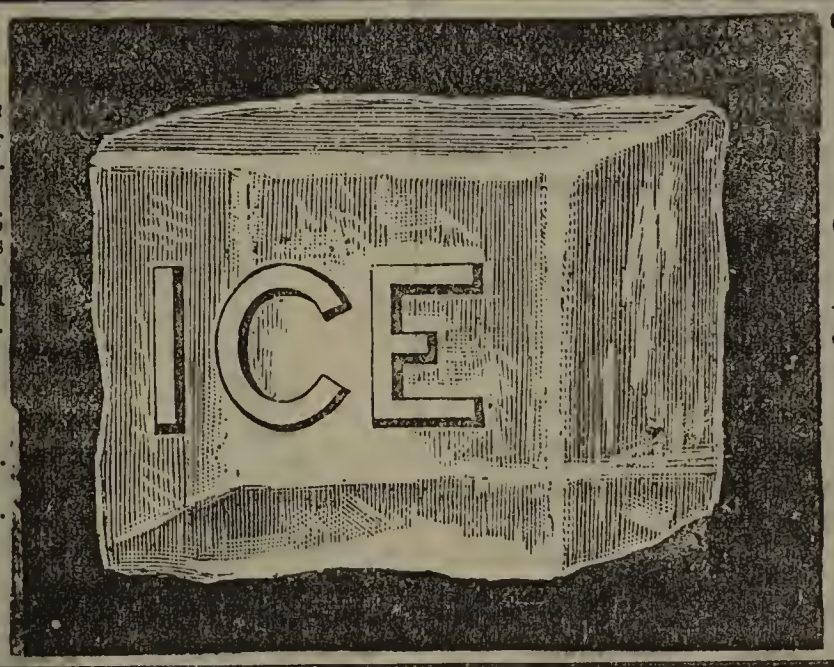

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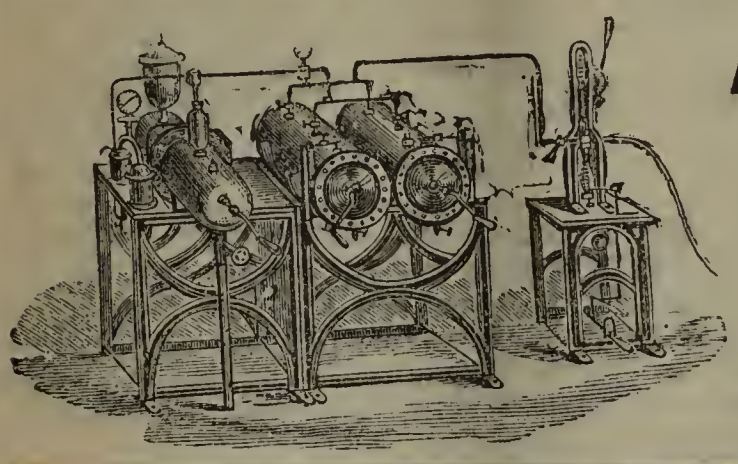

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EVENING MEETING.

The next EVENING MEETING will be held on Wednesday, April 4th, 1883, at Eight o'clock.

The Chair will be taken at half-past Eight *precisely*.

Papers intended to be read at that Meeting should be forwarded to the Secretary not later than Wednesday, March 28th, as papers received after that date cannot be announced in the *Pharmaceutical Journal* previous to the Meeting.

ELECTION OF COUNCIL AND AUDITORS.

EXTRACT FROM THE BYE-LAWS.

SECTION 5, CLAUSE 3.—"Any person qualified to vote desirous of nominating any Member for election as a Member of the Council or as an Auditor, shall give notice in writing, with the name and address of the nominee, and, if for the Council, disclosing whether such nominee be or not a Pharmaceutical Chemist, to the Secretary of the Society, *on or before the 24th day of March*, in every year; and the Secretary shall, on or before the 26th day of March then instant, address and send by post to each nominee a notice of his having been so nominated, and inquiring whether he will accept office if elected, and in default of a written reply from such nominee, declaring his readiness to accept office, if elected, being received on or before the 31st day of March then instant, such nominee shall not be deemed eligible or willing to be elected."

PRELIMINARY EXAMINATION.*

This Examination will be held throughout Great Britain, at 12 o'clock at noon, on the first Tuesdays in January, April, July, and October. Candidates must give notice to the Registrar on a printed form of application, to be obtained from him, and pay the Fee, not less than *fourteen* days prior to that on which the examination is to be held.

* A Certificate of having passed any of the Examinations approved by the Council (a list of which may be obtained from the Registrar) will be accepted in lieu of this Examination, provided Latin, Arithmetic, and English were included in the subjects of the Examination for which the Certificate was granted.

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THE ANNUAL DINNER

of the Members of the Pharmaceutical Society and their friends.

A Meeting will be held at 17, Bloomsbury Square, on Wednesday, March 21st, at 12 noon, for the purpose of making preliminary arrangements for the Annual Dinner. The President in the Chair. Gentlemen interested in this annual gathering are invited to attend.

MAJOR, MINOR AND MODIFIED EXAMINATIONS.

The Board of Examiners for England and Wales meets at 17, Bloomsbury Square, London, in February, April, June, July, October, and December, and the Board of Examiners for Scotland meets at 119A, George Street, Edinburgh, in January, April, July, and October, for the purpose of conducting the above Examinations. Candidates must give notice to the Registrar in London, and pay the fee on or before the *first* day of the month in which the Examinations are held. Each candidate for the Major and Minor Examinations must, at the time of giving notice, produce a Registrar's Certificate of Birth, and a certified declaration that for three years he has been registered and employed as an Apprentice or Student, or has otherwise for three years been practically engaged in the translating and dispensing of prescriptions. Printed forms of declaration may be obtained from the Registrar in London. Each Candidate for the Modified Examination must state the number of the receipt for his declaration and his age at the time of giving notice.

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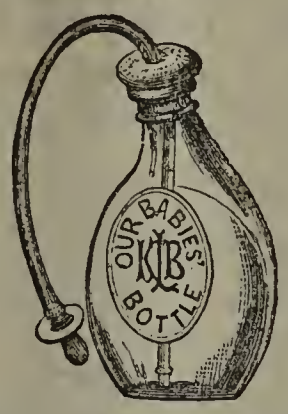

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(*Continued from page* 719.)

KRAMERIA, U.S.P.; RADIX RATANHIÆ P.G.—In the U.S.P. the root of *Krameria Tomentosa*, St. Hil., is now official, in addition to that of *K. triandra*. From the description of the latter given in the text, it would appear that *K. argentea* is intended, as the root is described as having a *dark* purplish brown bark, whereas that of Savanilla rhatany (*K. tomentosa*) is of a dull or *pale* purplish brown. As yielding a larger proportion of bark as compared with the almost tasteless woody centre, the roots of Savanilla or Pará rhatany are both preferable to the Payta rhatany, the knotted upper portion of which is difficult to powder or contuse. Moreover, the Savanilla rhatany is richer in soluble matter. In the P.G. the root of *K. triandra* is still the only official kind, probably on account of the colour of the tincture, which is redder than that of either Savanilla or Pará rhatany (*Pharm. Journal*, [3], vi., p. 21). Tests are given which preclude the use of either of the two varieties last mentioned (*Pharm. Journ.*, [3], i., p. 84). The woody portion being practically useless, and forming a large portion of the crude Peruvian drug, a weighed portion of the root bark would give a more uniform preparation.

LACTUCARIUM, U.S.P. and P.G.—The P.G. now directs that the liquid obtained by pouring boiling water on it should not, after filtration, become turbid when cold, nor become coloured if shaken with powdered iodine; the spirituous solution should not be changed by sesquichloride of iron. It should not yield more than 10 per cent. of ash.

LAPPA, U.S.P.—Retained from the secondary list, and a description added. It is referred to *Lappa officinalis*, Allioni.

LAVANDULA, U.S.P.; FLORES LAVANDULÆ, P.G.—According to the P.G. the calyx should be "coloris ferruginei." The greyish-blue calyx is here evidently confounded with the brown bracts.

MALVÆ, FLORES, P.G.—The flowers of *Malva sylvestris* only are now official. Under the name of "mallow flowers," both those of this species and of *Malva arborea* (*Althæa rosea*, Cav.) are popularly used in Germany, and the restriction to one species is likely to cause some inconvenience in certain districts.

MALVÆ, FOLIA, P.G., are obtained from *M. vulgaris* and *M. sylvestris*. It is difficult to understand why one species is not sufficient in this case. The ambiguity which results from the omission of the name of the botanical authority after the Latin name of a plant is well illustrated in this case. *Malva vulgaris*, Tenor, is identical with *Malva sylvestris*, L., and it is only by putting the name of Fries after *Malva vulgaris* that it is possible to know that *Malva rotundifolia* is intended by that name.

LIMONIS SUCCUS, U.S.P.—The sp. gr. should be not less than 1·030; and the juice evaporated to dryness and the residue ignited should not give more than 0·5 per cent. of ash. Fresh lemon juice should contain about 7 per cent. of citric acid.

LOBELIA, U.S.P.; HERBA LOBELIÆ, P.G.—The U.S.P. now directs the plant to be collected after a portion of the capsules have become inflated.

LUPULINUM, U.S.P.; GLANDULÆ LUPULI, P.G.—The U.S.P. directs that when agitated with water and allowed to stand no considerable sediment (sand, etc.) should be deposited. When ignited lupulin should not leave more than 8 per cent. of ash. The P.G. permits 10 per cent. of ash, and the glands when exhausted by ether should not leave more than 30 per cent. of insoluble matter, the ethereal solution on evaporation leaving a residue which should smell strongly of the hop. It should be kept from the light and not held in stock longer than a year. Owing to the great demand for hops, lupulin is at present scarcer and more adulterated than usual, vegetable matter which can only be detected by the microscope or by the ether test given in the P.G. being frequently mixed with it.

LYCOPODIUM, U.S.P., P.G.—It should be free from pollen, starch, sand and other impurities. The distinguishing features of lycopodium under the miscroscope are given. Dextrin and talc, which have also been found in lycopodium, are easily detected by means of the same instrument. The P.G. states that it should float on water or chloroform and leave no deposit in those liquids when shaken with them. It should not yield more than 5 per cent. of ash.

MALTUM, U.S.P.—It should be fresh, and not darker in colour than pale amber. Extract of malt is the only preparation.

MANNA, U.S.P., P.G.—The U.S.P. gives the specific gravity as 0·834. It should be slowly but almost completely soluble in 15 parts of boiling alcohol. The P.G., in which both *Manna cannulata* and *Manna communis* are still official, gives as a test of its purity that 5 parts boiled with 100 parts of spirit should leave about 1 part of insoluble but not viscid matter, and that 100 parts dried in a water-bath should not lose more than 10 parts of moisture.

MATICO, U.S.P.—The leaves are described as "oblong-lanceolate, pointed, unequally heart-shaped, very finely crenulate." The words "at the base" after the words "heart-shaped" are evidently wanting to complete the sense and the description.

MEL, U.S.P.—When diluted with 2 parts of water the resulting liquid should be almost clear, not stringy; it should have a specific gravity of 1·101 to 1·115 and a brownish or yellowish colour. If a small portion be diluted with 1 volume of water, then gradually mixed with 5 volumes of absolute alcohol, it should become only faintly opalescent, but not opaque, nor should it deposit a slimy substance at the bottom and along the sides of the test tube. When incinerated in small portions at a time in a platinum crucible it should not leave more than 0·2 per cent. of ash. It should not give evidence of the presence of starch, nor more than traces of chlorides and sulphates.

MEL DESPUMATUM, U.S.P.; MEL DEPURATUM, P.G. The U.S.P. preparation is made by merely heating the honey in a water-bath and straining off the scum which rises. The P.G. now omits the directions for preparing it, but gives the specific gravity as 1·30, and as tests of purity, that it should not change colour when mixed with an equal quantity of liquor ammoniæ nor be rendered turbid when a double quantity of spirit is added to it.

MELILOTI, HERBA, P.G.—This may now consist of *Melilotus altissimus*, as well as *M. officinalis*; the former is distinguished by the pods being distinctly acuminated and furnished with blackish hairs.

MEZEREUM, U.S.P.—The bark of *D. Mezereum* and of other species of *Daphne* is official. The bark is described as having the "outer surface yellowish or brownish yellow," a description which scarcely

applies to the stem bark of *D. Mezereum*; indeed it is difficult to understand how it is possible to give a detailed description which shall equally apply to "other species."

Moschus, U.S.P. and P.G.—According to the P.G. it should not afford an ammoniacal odour, a remark apparently intended to exclude Russian or Cabardine musk. It should be dried over sulphuric acid until it ceases to lose weight and should not afford more than 8 per cent. of ash when incinerated. The U.S.P. describes musk as contained in oval or roundish sacs about 1½ to 2 inches in diameter, apparently permitting the use of the Russian (oval) as well as Chinese musk, but excluding that of Assam. About 10 per cent. should be soluble in alcohol and 50 per cent. in water.

Myrrha, U.S.P. and P.G.—The U.S.P. requires that the brownish yellow alcoholic tincture should acquire a purple hue when nitric acid is added. Pieces of gum which do not answer to this test, and others which dissolve entirely in water, or merely swell up in it, should be rejected, tests which are evidently taken from the last P.G. The P.G. now refers it to *Balsamea Myrrha*, and states that 30 per cent. of the gum resin should be soluble in spirit and the residue left on evaporation of the alcoholic solution, when dissolved in ether, should on the addition of bromine vapour give a red or violet colour.

Nux Vomica, U.S.P.; Semen Strychni, P.G.—In the U.S.P. the seeds are described as having a silky lustre, but nothing is said concerning the margin. The P.G., however, points out that when the seeds are softened in water the subacute marginal line becomes more visible. The diameter in both Pharmacopœias is given as 25 millimetres. It was pointed out some time since in Bentley and Trimen's 'Medicinal Plants' that some specimens of the seeds contain more alkaloid than others. It is well known that the large seeds are more active than the smaller ones, hence a limit of size is of some importance. Another point, however, does not seem to be so generally recognized, viz., that the Bombay seeds, with a subacute margin and more silky lustre, contain much more alkaloid than those from Madras and Cochin China. In future Pharmacopœias this point will be worth attention, as a variation of strength in preparations made from so potent a drug might lead to dangerous results.

Oleum adipis, U.S.P.—It should become opaque at or below 0° C., and the sp. gr. should be 0·900 to 0·920.

(*To be continued.*)

VEGETABLE ALKALOIDS, AND THE METHODS FOR THEIR SEPARATION.*

BY MATTHEW HAY, M.D., DEMONSTRATOR OF MATERIA MEDICA, UNIVERSITY OF EDINBURGH.

(*Concluded from page* 720.)

Separation of Alkaloids.—Without being intelligently acquainted with these various physical and chemical qualities of alkaloids it is impossible that any one can competently undertake their separation. And it is based almost entirely upon the qualities I have briefly sketched, especially upon the relation of the alkaloids to solvents and precipitants, that the various methods for the separation of alkaloids have been devised.

Assuming that we are all more or less familiar with these characters of alkaloids, let us proceed to inquire in as plain and as practical a manner as is consistent with accuracy how we are to set about the separation of an unknown alkaloid. A plant is brought to us with reputed toxic powers, and we are desirous of isolating the alkaloid to which we suppose that the activity of the plant is due. We are not at once to assume that because the plant possesses a considerable degree of activity that its active principle is necessarily an alkaloid. It may belong to that important class of active principles, whose exact chemical constitution and position, with the exception of the glucosides, is so little understood that they are known by the very negative name of "neutral" principles. These bodies behave in relation to the various solvents I have already enumerated much in the same manner as alkaloids, and are often thus to be obtained by such methods employed for the separation of alkaloids as do not involve the use of precipitants. The activity of the plant may reside in a resin, as is the case with several plants possessing a cathartic action (*e.g.*, podophyllum), in a volatile oil (as in copaifera), or in a fixed oil (as in ricinus), or in some other constituent of the plant possessing no alkaloidal characters whatever. It is almost impossible to predict from the nature of the action of the plant whether its activity is dependent on the presence of an alkaloid or upon some other of the constituents. But as a rough guide in the expectation of the presence of one or other kind of active principle, it may be remembered that all poisonous plants which primarily act on the nervous system, producing tetanus, paralysis or narcotism, generally possess alkaloids as their active principles. On the other hand, if the action of the plant is primarily on the muscular system, as, for example, the large class of plants possessing the action of digitalis, then expect to find a neutral principle. It is a rule without exception that all pure simple bitter tonic plants possess as their active ingredient, likewise, a neutral principle. Further, if the action of the plant be cathartic, emetic, or purely astringent, then again there is probably no alkaloid present, but merely a neutral principle, or, perhaps, a resin.

If, from a consideration of these and other points, we become tolerably assured of the presence of an alkaloid, we can the more confidently proceed to lay down our plans for its separation. It is always advisable, before beginning what may prove a long and tedious analysis of some imperfectly known plant, to ensure, by the administration of a small quantity of it to one of the lower animals—a frog, a rabbit, a cat, or a dog—that the specimen of the plant or drug about to be examined really possesses the action ascribed to it. There is another reason why it is desirable to make one, and, it may be, several such preliminary experiments, and it is, that we render ourselves familiar with the nature of the action of the plant, and therefore with that of the alkaloid we desire to separate; and, accordingly, by making a similar experiment with our successive extracts, solutions or precipitates, we are enabled readily to ascertain in which of them the alkaloid is present. This form of physiological testing is most conveniently made with frogs, and best by subcutaneous injection; but, unfortunately, under the Vivisection Act we are not permitted to practise even so small an operation as a subcutaneous injection without a licence from the Home Office, which is not always easily obtainable.

Preliminary Extraction.—This experiment having been made, and having selected for that purpose the portion of the plant (seed, bark, root, etc.) which we believe, or may have proved, to contain the active principle, we take for our analysis the same portion of the plant, and begin by having it well comminuted or pulverized.

Now, let us consider for a moment in what chemical

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* Read by request before the North British Branch of the Pharmaceutical Society, Feb. 15, 1883.

form or combination the alkaloid exists in the plant or in the powder, and what is the nature of the substances with which it is mixed and from which it is to be separated. The alkaloid never exists in the plant in the free state but is invariably combined in the form of a salt, and oftentimes as an acid salt, with one or other of the organic acids which are found so generally in plants, particularly malic acid and the varieties of tannic acid. Sometimes the acid with which it is combined is, like the alkaloid, peculiar to the plant in which it is found, as meconic acid in opium, quinic acid in cinchona; and occasionally the acid may be even inorganic, as, for example, the sulphuric acid with which some of the opium bases appear to be united. To whatever acid the alkaloid may be joined it almost invariably forms a salt which is readily soluble in water or in alcohol, and which therefore can be extracted by either of these menstrua.

The various substances with which the alkaloidal salt is mixed is dependent, of course, upon the nature of the plant, and may be thus arranged, and at the same time their solubility in the three most common menstrua represented :—

	Water.	Alcohol.	Ether.
Cellulose . . .	insol.	insol.	insol.
Starch	insol. in cold. sol. in hot.	insol.	insol.
Gums and pectose.	sol.	partly sol.	insol.
Sugars	sol.	sol.	insol.
Fixed oils . . .	insol.	partly sol.	sol.
Volatile oils . .	slightly sol.	sol.	sol.
Resins	insol.	partly sol.	partly sol.
Albuminoids, incl. mucus. . . .	sol.	insol.	insol.
Neutral principles.	partly sol.	partly sol.	partly sol.
Colouring matters.	sol.	sol.	partly sol.
Organic acids and salts	sol.	sol.	partly sol.
Other organic matter	partly sol.	partly sol.	partly sol.
Inorganic salts .	mostly sol.	mostly insol.	insol.

It can be perceived at a glance what portions of the plant, in addition to the alkaloidal salt, are likely to be met with in extracts made with water, alcohol, or ether.

Continuing the examination of our plant, we now make choice of what solvent or menstruum will most readily dissolve the alkaloidal salt out of the plant, and at the same time carry into solution as few and as little as possible of the other constituents of the plant. Were the natural alkaloidal salt freely soluble in ether, which it is not, and did the ether penetrate readily the particles of the pulverized drug, we would feel inclined on account of its dissolving so few of the other vegetable substances to adopt it as an extractive solvent. As, however, a perfect extraction of the alkaloid is the primary object, we commonly find it advisable to use water or alcohol in preference to ether. Pure hot water is in nearly every case the best extractive solvent, and, after the plant has been repeatedly exhausted with water, the solvent power of the water in the final extraction may be increased by the addition of a small quantity of sulphuric acid or of tartaric acid. Even when alcohol is used it is sometimes advantageous to add a little acid. But on the whole it is advisable to use as little acid as possible. It is well not to employ too large a bulk of the solvent, for it may necessitate prolonged evaporation in order to remove a portion of the alcohol or the water at a later stage of the process. The extraction may be made by mixing the powdered plant with three or four successive portions of the solvent and allowing each mixture to stand for some hours, then draining and pressing; or the extraction may be made with the help of a percolator, particularly if the drug at our disposal is small in quantity or if alcohol is employed as the solvent.

Methods for Separation of Alkaloid.—We have now obtained a fluid extract of the plant, either watery or alcoholic, and its treatment for the separation of the alkaloid may take one of two different directions. We may endeavour to separate the alkaloid by precipitating it in the form of an insoluble salt, or we may remove it from the extract by means of solvents. The former method yields, as a rule, better results than the latter in respect both of the purity and the amount of the product, although it is not generally so well adapted for the separation and detection of small quantities of alkaloids in chemico-legal investigations, where often the absolute purity of the product is of less account, provided it satisfies the tests and possesses the physiological action of the alkaloid sought for. As the more important, therefore, for our purpose let us first consider in what manner the method by precipitation is to be followed.

A. Methods by Precipitation.—*Purification of Extract.*—The watery extract, or the alcoholic extract deprived of its alcohol by evaporation and the residue exhausted with water, if it has been prepared from a portion of the plant, as, for example certain woods and barks which yield to the water not much else than extractive matter besides the alkaloidal salt, may at once be treated with the precipitant; and this is also in many cases the course pursued if the alkaloid is present in large quantity, and can, on account of its insolubility in water, be precipitated in an uncombined form by the addition of an alkali (*e.g.*, morphine). If, on the other hand, the precipitation of the alkaloid, on account of the solubility of the alkaloid in water, or its presence in small quantity, requires the use of some of the more complex but more effective reagents, as phospho-molybdic acid or the double iodide of potassium and mercury, it is always necessary to previously remove from the extract as much of its inert organic matter as possible. For this purpose nothing surpasses a combination of basic acetate of lead and of ammonia. The basic acetate can of itself form insoluble precipitates with most of the organic acids, as malic acid; with many glucosides, as tannin, and with all albuminoids, starches, and gums. It can also very effectually remove the colouring matter; but the presence of free ammonia is essential to its completely precipitating dextrine and the various sugars. The ammonia may be added either immediately after the addition of the basic acetate of lead without previous filtration; or the precipitated lead compounds may be first removed by draining or filtration, and the ammonia mixed with the filtrate which should contain an excess of the basic acetate. The ammonia is added until the fluid, after stirring, begins to smell distinctly of ammonia; no alkaloid is known to be precipitated by basic acetate of lead and ammonia. The fluid having been again filtered is now evaporated at a moderate heat over the water-bath to drive off the excess of ammonia and to diminish the bulk of the fluid, which may with advantage be reduced until the fluid becomes of a syrupy consistence, so that the ammonia may be almost completely removed. The partially evaporated fluid is, if syrupy, diluted with some water, and now treated with dilute sulphuric acid in sufficient quantity to precipitate all the lead in the form of the insoluble sulphate of lead, and the fluid is once more filtered. The fluid will generally at this stage be found pure enough to permit of the precipitation of the alkaloid by means of any form of precipitant. If it is still highly coloured and evidently contains a large proportion of extraneous organic matter, the process of precipitation with the basic acetate of lead and with ammonia may be repeated; but, generally, this is not needed.

Precipitants.—The stage has now been reached when we must select an alkaloidal precipitant. If the alka-

loid be insoluble in water, a solution of any one of the alkalies or alkaline carbonates, or of the alkaline earths, will prove the most ready and effectual precipitant. But if, as it far oftener occurs. the alkaloid is soluble to some extent in water—and, indeed, whether soluble or not—we must resort to the use of some of those acids or salts, which have already been mentioned as forming insoluble precipitates with practically every alkaloid. These precipitants may be divided into four classes :—

(1.) Some *simple organic acids*, as tannic acid (Berzelius) and picric acid (Hager).

(2.) Some *compound inorganic acids*, as phospho-wolframic acid (Scheibler), phospho-molybdic acid (De Vrij, Sonnenschein), and phospho-antimonic acid (Schulze).

(3.) The *chlorides of the heavier metals*, as those of platinum (Dragendorff), gold, iridium, and palladium (V. Planta).

(4.) Certain *double metallic iodides*, as those of potassium and mercury (V. Planta, Mayer), potassium and bismuth (Dragendorff), and potassium and cadmium (Marmé).

The cost of the third group precludes their general use, but each of the precipitants of the other groups has its advocates. The best of them are probably phospho-wolframic acid, phospho-molybdic acid, the double iodide of potassium and mercury, the double iodide of potassium and bismuth, and tannic acid.

Precipitation.—Each precipitant, except the last, acts most effectually in the presence of dilute mineral acid ; and the acid most commonly used is sulphuric, which is at any rate present in excess in the extract, on account of its having been used to remove the lead. Tannic acid must be added in a neutral or faintly acid solution, and sometimes, owing to the acid which is being set free from the precipitated alkaloid being large in amount and rendering the fluid too acid, a little alkali or alkaline carbonate may require to be added before complete precipitation can be secured. In the use of the other precipitants, no precaution is, as a rule, necessary, unless it is to take care that the fluid has a well-marked acid reaction, and that previous to filtering the fluid is allowed to stand for a day or so, in order to ensure the complete precipitation of the alkaloidal compound. It is important, as Schmiedeberg has remarked for the double iodide of potassium and mercury, that the solutions of the double iodides do not contain any more iodide of potassium than is sufficient for the solution of the heavier iodide, otherwise the excess of the iodide of potassium may, in certain cases, dissolve the alkaloidal precipitate. To avoid this, the solution should be made by adding excess of the heavier iodide to a solution of the iodide of the alkali, allowing the latter to dissolve as much of the former as it can, then filtering, to remove the undissolved iodide, and observing that the filtrate does not give a precipitate on dilution ; if it does, dilute and again filter. The alkaloidal precipitate obtained by the use of tannic acid, or of one of the composite organic acids, or of one of the double iodides, is now separated by filtration. The tannic acid precipitate may be washed with a little water ; the others must be washed with dilute sulphuric acid, as water alone is apt to decompose and dissolve them. The precipitate is then dried in the usual way by pressure between several folds of filter paper, and is transferred to a beaker and mixed with a little water.

Liberation of Alkaloid from Precipitate.—The means necessary for the liberation of the alkaloid from its insoluble salt varies with the nature of the precipitant, but is the same for the members of each of the different kinds or groups of precipitants ; that is, there is one method to be followed in the treatment of the precipitate with tannin, another for all the precipitates with the double iodides, and a third for all those with the composite acids.

a. From Tannic Acid Precipitate.—The treatment of the precipitate with tannic acid is simple, and consists in gently digesting it for some time with moist and freshly precipitated oxide of lead, until a portion of the supernatant fluid or filtrate is no longer darkened by the addition of ferric chloride. If the alkaloid which has been set free is soluble in water, then it will all be contained in the filtrate, from which any trace of lead is removed by passing sulphuretted hydrogen through it, and again filtering. The filtrate, if gently heated for a short time over the water-bath, will have the excess of sulphuretted hydrogen readily dissipated. By continued slow evaporation, crystals of the alkaloid may be got; or it may be exactly neutralized with a dilute mineral acid, and a crystalline salt obtained by evaporation. The further steps necessary for the perfect purification of the alkaloid or of its salt, I shall immediately come to.

If the liberated alkaloid be insoluble, it remains mixed with the precipitated tannate of lead, and with the excess of lead oxide, and requires to be extracted with alcohol. The alcoholic extract is evaporated almost to dryness and dissolved in dilute sulphuric acid, any trace of lead remaining undissolved as sulphate of lead. The acid solution of the sulphate of the alkaloid is then treated with carbonate of barium to remove the acid, but of course at the expense of the precipitation of the alkaloid (as the carbonates of the alkalies or alkaline earths behave as bases towards solutions of alkaloidal salts). The mixture is filtered, and the alkaloid once more extracted with alcohol. Slow evaporation of the alcohol will, under favourable circumstances, yield crystals of the alkaloid.

b. From Double Iodide Precipitate.—If one of the double iodides has been employed for the original precipitation of the alkaloid, then the precipitate, which is a double iodide of the alkaloid and the heavier metal, requires a different process for the recovery of the alkaloid. It is mixed with a little water and with an equal volume of the moist hydrated oxide of barium, and a stream of sulphuretted hydrogen gas is passed through the mixture until the fluid, after being shaken, smells strongly of the gas, when the double iodide will have become completely decomposed, forming an insoluble sulphide of the heavy metal—mercury, bismuth or cadmium, as the case may be—the alkaloid being dissolved in the form of the simple iodide. The previous addition of the baryta facilitates the decomposing action of the sulphuretted hydrogen. The fluid is filtered to remove the insoluble sulphide, and the filtrate which contains the iodide of the alkaloid, and the iodide and the sulphide of barium, is treated with excess, either of moist and freshly prepared oxide of lead, or of sulphate of silver. The latter precipitates the hydriodic acid in the form of iodide of silver, the sulphuretted hydrogen in the form of sulphide of silver, and the barium as sulphate of barium, and leaves the alkaloid in the form of a soluble sulphate; whereas, the oxide of lead, whilst it precipitates with equal effectiveness the hydriodic acid and the sulphuretted hydrogen, and the barium as oxide of barium, yet it sets free the alkaloid in an uncombined state ; and if the alkaloid be insoluble in water, it remains mixed with the precipitates.

Where the sulphate of silver has been employed, the filtrate, after the addition of this reagent, contains the unused excess of the reagent as well as the sulphate of the alkaloid. To remove the silver, the fluid is treated with an excess of barium hydrate, and sulphate of barium and oxide of silver are formed and the alkaloid is liberated, which, according as it is soluble or insoluble in water, is dissolved in the filtrate or remains precipitated with the barium and the silver. If it is dissolved in the filtrate, the small excess of barium hydrate is removed by a stream of carbonic acid gas, and the barium carbonate is then got rid of by filtration, and the filtrate gently evaporated, when the alkaloid will be obtained. If the alkaloid is insoluble in water and remains mixed with the precipitates, then, after filtration, the residue is exhausted with alcohol, and the alcoholic solution treated in the same manner as that obtained from the tannate of lead in the previous process.

If oxide of lead has been used for the precipitation of the iodine, it is advisable to previously render the fluid

slightly acid with sulphuric acid, so as to precipitate the barium as sulphate of barium. The oxide should then be digested with the fluid, until the fluid has an alkaline reaction. The precipitate from the oxide of lead may, as already mentioned, contain the alkaloid, if it be insoluble. If it be soluble, it will be met with in the filtrate, which, in order to deprive it entirely of its lead, is treated with a little sulphuretted hydrogen and again filtered. The filtrate then requires the same treatment, in order to isolate the alkaloid, as was described in connection with the filtrate obtained at the same stage of the tannin method. The alkaloid if insoluble in water is also obtained from the mixed precipitate in the same manner as previously described.

c. From Precipitate with Composite Inorganic Acid.—The process required for the separation of the alkaloid from its precipitate with the composite inorganic acids is simpler than the preceding; and to that extent is one or other of these acids to be preferred for the precipitation of the alkaloid. The precipitate, after being pressed, is thoroughly mixed by frequent stirring with a little water and more than an equal volume of pure barium hydrate, until it is completely decomposed, which is readily indicated by the excess of the dissolved barium hydrate forming with the carbonic acid of the atmosphere an insoluble scum of carbonate on the surface of the fluid. The mixture is now filtered, and the alkaloid, if it be soluble in water, passes through in the filtrate mixed only with a little barium hydrate, which can be readily removed by precipitation with a stream of carbonic acid gas. The filtrate on gentle evaporation will yield the alkaloid; or, if it be previously neutralized with dilute sulphuric acid, or other simple acid, crystals of a salt of the alkaloid may be obtained. If the alkaloid be insoluble in water, it remains mixed with the insoluble wolframate of barium and with the excess of baryta, and can be removed by alcohol, and the alcoholic solution treated in the usual way.

Purification of Alkaloid.—By these various methods of precipitation it is possible to obtain, and in the manner described, a tolerably pure alkaloidal product. For its more complete purification it is sometimes necessary to make a solution of it in water and a little acid, and to repeat the process of precipitation and isolation; and, whether it be reprecipitated or not, if it possesses a tinge of colour it is often advantageous to treat its solution in water or in alcohol, or the solution of its salt in one of these menstrua, with pure animal charcoal, remembering that the charcoal is apt to remove a portion of the alkaloid, which can, however, be re-obtained by treating the charcoal with boiling alcohol. Also, repeated crystallization of the alkaloid or its salt from a solution in alcohol or in water may be required to furnish a perfectly pure product. The *technique* of the methods employed for this purpose is quite familiar in every department of chemistry, and, therefore, requires no further mention.

When it is desired to procure a very pure salt of the alkaloid of definite composition and of good crystalline form for the purpose of an elementary analysis, the double salt obtained by the addition of chloride of platinum or chloride of gold to a solution of the alkaloid, will generally be found to best meet the requirements.

These, then, are, quickly stated, the most reliable methods for the separation of the alkaloid by precipitation, and important modifications may be necessitated in each individual practical application of the methods, which can only be suggested in the course of the analytical investigation. For example, other solvents than alcohol may be required for the extraction of the alkaloid from the mixed precipitates, and it is an easy matter to try one after another until the most efficient is obtained.

Separation of Volatile Alkaloids.—I have described these methods as if the alkaloid were non-volatile, which in the great majority of instances it is; but there are exceptions, as I formerly mentioned. In such cases the separation of the alkaloid is generally most easily accomplished, often even without making a preliminary extract with alcohol or water, merely by mixing the drug with a little water and alkali or alkaline earth, and distilling, neutralizing the distillate, and again distilling to remove other volatile substances, the alkaloid remaining in the retort in the form of a non-volatile salt. This can be dissolved in water or alcohol and purified by crystallization, etc., in the usual way, and a perfectly pure alkaloid obtained from the salt by a final distillation with an alkali. The presence of a volatile alkaloid is generally to be perceived by its odour at that stage of the operations required for the separation of an alkaloid by precipitation, where oxide of lead or barium hydrate is being employed for the decomposition of the precipitated compound of the alkaloid, on the alkaloid being set free. If so, it is advisable to add excess of barium oxide and distil. A tolerably pure alkaloid will in this manner be obtained.

B. Methods by Solution.—The other series of methods for the separation of alkaloids, and which mainly involves the use of solvents, without precipitants, is that which, as I have already mentioned, is in one form or other most frequently employed for the medico-legal isolation of alkaloids. They were formerly the only methods used, but at the present time the precipitation methods are considered more serviceable in pharmaceutical research. These methods mainly depend on the following facts:—(1) When an acid solution of the alkaloid is shaken with ether, chloroform, amylic alcohol, benzol, acetic ether or petroleum ether, the alkaloid is not removed by these solvents; but, (2) When the solution is alkaline, the alkaloid is readily taken up by one or other of these solvents. In short, these methods rely on the solubility of the free alkaloid and the insolubility of its salts, in certain menstrua which are non-miscible with water.

Purification of Extract.—When it is desired to separate an alkaloid by means of solvents, an extract of the plant is made with acidulated water or alcohol just as when precipitants are intended to be employed. The watery extract, which is the more preferable, is neutralized with carbonate of soda, and cautiously evaporated almost to dryness, and the residue is treated with acidulated absolute alcohol, which dissolves the alkaloid and leaves some albuminous and other matter. The filtrate is again neutralized with carbonate of soda and evaporated to dryness, and the residue dissolved in water. It is always strongly advisable never to evaporate fluids containing alkaloids without previously neutralizing them, otherwise the alkaloids are very prone to suffer decomposition.

Separation of Alkaloid.—The aqueous solution is now rendered acid with a little sulphuric acid or other simple acid, and is well shaken with successive portions of ether to remove fats and resins, and the ether poured off. The ether, as a rule, in the presence of acid dissolves none of the alkaloid; but there are one or two exceptions where a small portion of the alkaloidal salt is removed by the ether. If any of the alkaloid should chance to be thus removed, evaporate the ether and treat the residue with water. The watery extract will contain the alkaloid. But, if, as almost invariably happens, the ether has removed none of the alkaloid, the acidified aqueous solution is now rendered alkaline by means of carbonate of soda or a little caustic soda, and is again well shaken with successive quantities of ether, which, in the great majority of cases, will completely dissolve out the alkaloid. Should the alkaloid prove to be insoluble in ether, it is necessary after pouring off the ether to neutralize the aqueous fluid and heat to drive off the ether, and again render it alkaline, and shake it with another of the alkaloidal solvents enumerated, as chloroform, or amylic alcohol, or benzol, or with a succession of them. The ethereal or other solution of the alkaloid, in order to purify it, is then shaken with an equal volume of slightly alkaline water. Sometimes, to ensure a still greater degree of purity, the

ethereal or other solution is next shaken with water containing a little sulphuric or hydrochloric acid, which transfers the alkaloid to the water, and this may now be shaken with successive portions of pure ether, or whatever solvent has been previously used, to completely remove from it all substances soluble in the ethereal menstruum in the presence of acid. On adding an alkali or alkaline carbonate to the water, it readily gives up the alkaloid to a fresh portion of the ethereal solvent when shaken with it. Evaporation of this purified ethereal solution will generally yield the alkaloid in a tolerably pure condition. For its further purification, digestion with charcoal and crystallization of the alkaloid or its salts from their solution in water or alcohol may be necessary.

This is merely an illustrative outline of a process embodying the principles involved in the method of separating alkaloids by means of solvents. As this method is very largely employed in medico-legal investigations, several more detailed descriptions of processes will be found in the numerous works on toxicology (Husemann, Otto, Dragendorff, Taylor, etc.). Of these, the process or method of Stas, as improved by Otto, is the oldest and the best known, and, perhaps, still the most frequently employed. In it ether and amylic alcohol are successively employed as solvents. The method of Erdmann and Uslar, in which amylic alcohol is the main solvent employed, has been also favourably received. Dragendorff's method is, perhaps, of all the most thorough, and involves the use of nearly all the important alkaloidal solvents.

Separation of Alkaloids from one another.—In the processes which I have described as being used for the separation of alkaloids, I have nearly always spoken as if but one alkaloid were to be met with in each plant. But, as a matter of fact, many plants, perhaps, it will be eventually found, most toxic plants, contain more than one alkaloid. The product obtained by the methods described may, therefore, consist of a mixture of alkaloids. If so, the alkaloids are to be separated from each other by taking advantage of the differences in the degree of the solubility of themselves or their salts in the various solvents mentioned, water included.

Recognition of Alkaloid.—When once the substance is supposed to have been isolated in a pure form, it is necessary to make certain that it is in reality alkaloidal. If it be an alkaloid or alkaloidal salt it will when heated to redness, like all organic matter, completely burn away. Mixed and heated with soda-lime (a mixture of caustic soda and lime) it will, unlike neutral active principles and other nitrogen-free organic substances, evolve the odour of ammonia. Further, a solution of the alkaloid or of its soluble salts, will give a precipitate with nearly all the substances already mentioned as generally forming insoluble salts with alkaloids. The physiological action of the separated product will also sometimes be of help in determining whether it is alkaloidal or not. One must guard against mistaking a salt of ammonia for a salt of an alkaloid, as the former behaves chemically in almost every respect quite like an alkaloid.

Conclusion.—These, then, are, briefly stated, the various processes or methods employed for the separation of alkaloids. It is impossible in the present state of our knowledge to lay down any single general method which will suffice for the separation of any alkaloid. It will therefore rest with each chemist to choose the method that may appear to him the most suitable for the plant he is about to examine, and to use his own discretion and ingenuity in modifying it when necessary. It has been mainly my aim in the present communication to lay before you the general principles which guide us in the separation of alkaloids.

In conclusion, allow me to say that, whilst only a few of you may have the opportunity of discovering an unknown alkaloid, yet many of you may be able to improve and cheapen the processes by which we at present obtain known alkaloids. Pure alkaloids of definite composition, and, therefore, of unvarying action, are what the therapeutist requires; and the chemist who can furnish him with these, and by the readiest and cheapest methods, benefits both therapeutics and pharmacy as much as he who brings to light a new alkaloid. For all new alkaloids are not of value medicinally.

To those who are proficient scientific chemists, and who devote themselves in great part to pharmaceutical research, there lies open the almost untrodden field of the artificial production of both known and unknown alkaloids. The syntheses of Schiff and Schmiedeberg cannot surely remain solitary. The capability of the artificial formation of all alkaloids is in the highest degree probable. And what synthetical chemistry is now in certain instances doing for the arts, we are all hopeful, and even confident, will soon be accomplished for the materia medica.

During the course of the lecture Dr. Hay very successfully demonstrated the practicability of the various methods of separation to which he referred. He also showed a collection of rare active principles, as well as the more important bodies existing in vegetable tissue and from which alkaloids are separated.

The President, in moving a vote of thanks to the lecturer, said that he was sure that those present would join with him in admiration of the manner in which the interesting subject had been treated. It was a subject of great pharmaceutical importance, and he was sure that the younger members, who had the opportunity before them, would receive from the lecture a stimulus for research, since Dr. Hay had made each stage of investigation appear so simple. He had much pleasure in proposing a cordial vote of thanks to Dr. Hay.

Mr. Dott, in supporting the motion, said that although there were some points on which he differed from what had been said, yet, generally his experience would lead him to agree with the principles laid down. It should not be forgotten that a process which might be applicable in a chemico-legal investigation, for instance, might not, for economical grounds, be suitable on the manufacturing scale. There were at least two general laws to be observed in all cases, namely, *low temperature* and *neutrality*. It was commonly stated that all alkaloids were soluble in alcohol. This was not universally so,—pseudo-morphine and rhœadine forming striking exceptions to the rule. Regarding the greater solubility of acid salts of alkaloids, he mentioned that the acid tartrate of morphia was an exception, the neutral tartrate in this case being more soluble. There was a process recommended for the elimination of alkaloids, in which a solution of oxalic acid was employed for exhausting the drug. He thought that this was probably the worst acid which could be used as a solvent, because oxalates were the most insoluble salts of alkaloids, and, moreover, alkaloids in combination with organic acids were far more liable to be decomposed on evaporation than when they were in combination with inorganic acids. For these reasons he thought that acids of the latter class ought always to be used.

Mr. Stephenson having made a few remarks in support of the motion,

Dr. Hay thanked the meeting for the manner in which his communication had been received. Referring to Mr. Dott's remarks, he said that the methods which he had proposed were such as were best adapted for the purposes of investigation; they were well-tried methods, and in his own hands they had been very satisfactory, the only trouble he had had being in the separation of one alkaloid from another in a good crystalline form. Regarding the solubility of acid salts, he said that the exception which had been referred to was worthy of note, since it was another indication of the brotherhood existing between alkaloids and ammonia—the acid tartrate of ammonia being less soluble than the neutral tartrate.

The Pharmaceutical Journal.

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PHARMACEUTICAL EDUCATION AND EXAMINATION.

THE adoption by the Council, at its last meeting, of the whole of the recommendations contained in the report of the Committee to which the subject of the relation to each other of pharmaceutical education and pharmaceutical examinations had been referred for reconsideration, closes the history of the first stage in a praiseworthy attempt to prevent failures in passing the pharmaceutical examinations by ensuring that candidates shall have gone through a systematic course of study before presenting themselves. At present it is proposed to bring the new regulations into force on and after December 31, 1887, and although it is not certain whether this will be effected under the powers of the Pharmacy Act, 1868, or of the legislation which it is hoped will take place during the present session of Parliament, it should be noted that if this arrangement be carried out it will have a retrospective effect reaching back to the end of the present year. The whole subject is of the greatest importance to persons who contemplate becoming qualified pharmacists and their friends, by whom the new scheme should be carefully considered, and to facilitate this it may be as well to give a *résumé* of the principal features of the proposed regulations, as now adopted, especially as they have only appeared in a fragmentary form in the official report.

The first step to be taken by a candidate for qualification to practise pharmacy will be to become registered as a "pharmaceutical student," either by passing the Preliminary examination of the Pharmaceutical Society, or by presenting to the Board of Examiners evidence that he has passed one of the examinations the certificates of which are accepted in its stead. A list of these latter examinations will be found in the *Pharmaceutical Journal* for March 5, 1881, or may be obtained upon application to the Registrar. Between the date of effecting this registration and that of the candidate presenting himself for the final portion of the qualifying examination at least four years will necessarily have to elapse in order to comply with the following requirements. Three of these years will have to be spent in practical employment as an apprentice or pupil in the pharmacy of a pharmaceutical chemist or registered chemist and druggist, after which the pharmaceutical student will be eligible to present himself for the first portion of the qualifying examination. In the event of the student passing this, he will have to pursue his studies, and at the end of another year he will be entitled to present himself for the second and final portion of the qualifying examination. That the provision as to the regulations coming into force at the end of the year 1887 is intended to have a retrospective effect in regard to these four years is shown by a special note, appended to the report, in which it is stated that the effect will be that "all candidates who shall "pass the Preliminary examination after December "31, 1883, will not be eligible to present them- "selves for the first portion of the qualifying "examination until the expiration of a period of "three years from the date of their having been "registered as having passed the said Preliminary "examination."

As to the range of studies to be undertaken by the pupil during these four years, it may be stated that besides such practical training as he may obtain during his stay of three years in a pharmacy, he will have to attend at some school recognized by the Council, and at some period between the date of his registration as a "pharmaceutical student" and the time when he presents himself for the second portion of his qualifying examination, three courses of lectures, of a defined scope and character, one on Chemistry, one on Botany, and one on Materia Medica, as well as a course of instruction in Practical Chemistry. The course on Chemistry will have to comprise not less than eighty lectures, that on Botany not less than forty-eight lectures, and that on Materia Medica not less than forty lectures, at least four-fifths of which must be attended by the student; each lecture is to be the length of at least one hour, and each course is to extend over at least five months. The course of instruction in Practical Chemistry is to extend to two hours daily for ten months, three hours daily for five months, five hours daily for three months, or some modification in which the course shall not extend over a period of less than three months or more than twelve months, or exceed five hours in any single day.

It will be apparent from the foregoing that the qualifying examination is to be divided into two portions. The first portion, for which the "pharmaceutical student" will be eligible as soon as he can present evidence that he has passed the prescribed three years in a pharmacy since his first registration, will include Prescriptions, Pharmacy, and Theoretical Chemistry. This will be entirely in writing, and will be conducted in London, Edinburgh, and other centres in the provinces, under the superintendence of members of the Board of Exa-

miners. The second portion, upon entering for which the candidate will have to produce evidence that he has passed the first portion at least a year, has completed the "curriculum," and is twenty-one years of age, will be practical and *vivâ voce*. It will include Practical Dispensing, Botany, Materia Medica and Chemistry.

No argument is needed to enforce the probability that the carrying out of a scheme of systematic training for the calling of a pharmacist, such as that described above, will contribute materially to reduce the proportion of rejections in the examination rooms; as to this all are agreed, and objections that have been raised against the scheme have been based on other considerations. But just a reference may be made to the statistics contained in one of the short notes published in the Journal for last week, as bearing upon this point. It appears from these that at the end of the last term of the Paris School of Pharmacy nearly an equal number of candidates presented themselves for their final examination as pharmaciens in each grade. But whilst only 19·5 per cent. of the candidates for the first class failed to pass, those for the second class, from whom the requirements as to preliminary education are less stringent, suffered 45·4 per cent. of rejections.

MEDICAL ACTS AMENDMENT BILL.

Since the publication of our last number, a Bill has been introduced into the House of Lords by the Lord Privy Seal for the consolidation and amendment of the law relating to medical practitioners. This Bill is based upon the report of the Royal Commission on the Medical Acts, a *résumé* of which appeared in this Journal last July. Conformably with the recommendations contained in that report it is proposed in the present Bill to establish three Medical Boards for England, Scotland and Ireland respectively, consisting, in the case of England, of members chosen by the Universities of Oxford, Cambridge, London, Durham and the Victoria University, the Royal College of Physicians of London, the Royal College of Surgeons of England and the Apothecaries Society of London. The Scotch Board is to consist of members chosen by the Universities of Edinburgh, Glasgow, Aberdeen and St. Andrew's, the College of Physicians and Surgeons of Edinburgh and the Faculty of Physicians and Surgeons of Glasgow. The Irish Board is to consist of members chosen by the Universities of Dublin and Irelond, the King's and Queen's College of Physicians, the Royal College of Surgeons and the Apothecaries' Hall.

These Medical Boards are to be renewed every five years by election, the retiring members being eligible for re-election, and casual vacancies by death or resignation meanwhile are to be filled up by the choice of fresh members by the constituent authorities which returned the members who caused the vacancies. The Privy Council is to have power to extend or withdraw the privilege of returning members to a Medical Board. The functions of these Boards are to regulate examinations, appoint examiners, and as far as possible establish uniformity of standard in the qualifying examinations, subject to the control of the Medical Council and the Privy Council.

For the reconstitution of the Medical Council it is proposed that it shall consist of eighteen members, six of them nominated by the Crown, with the advice of the Privy Council, two elected by registered medical practitioners resident in England, one by registered practitioners in Scotland, and one in like manner for Ireland, four by the English Medical Board, two by the Scotch and two by the Irish Boards. The Crown nominees need not be members of the medical profession. The duties of the Medical Council are to comprise visitations of the examinations conducted for the purposes of the Act, inquiry into their efficiency and regulation of the duties to be performed by the Medical Boards.

The course of medical education is to be prescribed and regulated by the respective Medical Boards, and the sufficiency of the education provided at recognized schools is to be ascertained periodically by inspection carried out by the Medical Boards.

In regard to the regulation of medical practice the Bill indirectly recognizes the existence of unqualified practitioners and does not impose penalties upon them unless they use medical titles to which they have no right, or represent themselves to be legally qualified, or use designations or descriptions denoting that they are qualified by law to practice. Consistently with the provisions of the Bill in this respect it proposes to repeal so much of the "Apothecaries Act, 1815," as confers any privileges or enacts any restrictions inconsistent with the provisions of the present Bill.

Lastly, the provisions for the publication of the British Pharmacopœia are in effect the same as those in the Medical Act, 1858, namely, that the Medical Council shall, from time to time, cause the Pharmacopœia to be published under its direction. Among the saving clauses it is provided that nothing in the Act shall in any way prejudice or affect the lawful occupation or business of chemists or druggists, nor the rights, privileges or employment of duly licensed apothecaries in Ireland, so far as relates to selling, compounding or dispensing medicines.

PROPOSED INTERNATIONAL PHARMACEUTICAL EXHIBITION IN VIENNA.

We have been favoured by the Executive Committee with a copy of the arrangements that have been made for carrying out this exhibition, which promises to be one of remarkable interest to pharmacists. From this we learn that the enterprise is

to be under the auspices of the Allgemeine oesterreichische Apothekerverein and the Oesterreichische pharmaceutische Gesellschaft of Vienna, the Apotheker-Hauptgremien of Vienna, Gratz and Troppau, and the Lower Austrian Apotheker-Gremien of Fünfhaus and Melk, so that the entire empire is well represented. The exhibition, which is to be held in the rooms of the Imperial Horticultural Society, in the Park Ring, Vienna, will open on the 11th of August and close on the 27th, and will be divided into five "groups." Group 1 will consist of scientific instruments and contrivances used for pharmaceutical purposes; Group 2, of literature of pharmacy and the allied sciences; Group 3, of apparatus and machinery for the preparation of medicinal products; Group 4, of apparatus and utensils necessary or useful in pharmacy; Group 5, of drugs, chemical products, pharmaceutical preparations and articles intended for medicinal purposes; and Group 6, of contributions to the history of pharmacy. All medicinal specialties, of which the composition and manner of preparation are not based upon recognized rational and scientific principles, are to be excluded, as well as all nostrums without distinction, whether their composition is known or not.

For the management of the exhibition a large Executive Committee is formed, consisting of representatives from the above-mentioned Societies, and from manufacturing and commercial firms. Of this Committee, Herr A. von Waldheim is President, and Dr. A. P. Hellmann, Vice-President, the Secretaries being Dr. Hans Heger and Herr F. Kwisda. The distinctions which it is proposed to award in recognition of special merit in the exhibits are—diplomas of honour, gold medal diplomas and silver medal diplomas.

A charge will be made for space according to the following scale:—Per square metre, having a metre or a portion of a metre, of frontage, 16*s.* 8*d.* Per square metre in the open room, or portion of a metre, £1 13*s.* 4*d.* Per metre of wall surface, 8*s.* 4*d.* A reduction of 20 per cent. will be made in cases where at least ten square metres are taken. All expenses connected with an exhibit will fall upon the exhibitor, the Committee only promising to exercise careful supervision. The articles will have to be in place before the 6th of August and removed by the 31st. Applications for space or for further information should be addressed to Dr. Hans Heger, 22, Berggasse, Vienna, IX.

We regret to have to report the death, on Sunday week, of two Benevolent Fund annuitants, Mr. George Godden, in the 87th year of his age, and Mrs. Ellen Parkes, in her 64th year. Mrs. Parkes was elected in December, 1878, and as the only annuitant who previous to the last election came within the requirement of having been "a subscriber or the widow of a subscriber," received the £5 "Robbins Gift." Mr. Godden was elected in 1881.

On Wednesday next, at noon, a meeting will be held at 17, Bloomsbury Square, with the object of making preliminary arrangements for the usual Dinner of the Members of the Pharmaceutical Society and their friends in connection with the Annual Meeting in May. For obvious reasons it is desirable that the company at the Dinner should this year be numerous and representative, and it is hoped that with a view of attaining this end many of our readers will make a point of being present at the meeting on Wednesday.

* * *

Just before going to press we have received a telegram from Leeds stating that a good meeting of the trade was held there on Wednesday for the purpose of considering the Draft Bill for the Amendment of the Pharmacy Acts. The result was a unanimous expression of cordial approval of the Bill, the only addition suggested being an extension of the present exemption from jury service, which it was decided to ask the Council to endeavour to obtain.

* * *

In the House of Commons, on Friday the 9th inst., in reply to a question put by Mr. Warton, Mr. Mundella stated that it is the intention of the Government to introduce into the House of Lords a Bill for the further regulation of the sale of poisons, which will include provisions respecting the sale of so-called patent medicines of a poisonous character.

* * *

A Bill to amend the law governing the sale of drugs and poisons in the County of Kings, State of New York, has been drawn up by the local pharmaceutical association, which proposes to make it illegal for any but registered pharmacists to "open or conduct any store or place for retailing, compounding or dispensing drugs, medicines or poisons, or to practise pharmacy within the county." The Bill would create two grades of qualification: one for "registered pharmacists," who are to be persons whom the examiners may deem competent to act independently as principals or to be entrusted with the sole charge of pharmacies, the other for "assistant pharmacists," who will only be entitled to act under the direction of registered pharmacists. It would also make it unlawful to employ in a pharmacy any person who is not either a registered pharmacist or an assistant pharmacist or a student, apprentice or aid acting under the immediate supervision of such a person.

* * *

Special committees have been appointed by the College of Pharmacy of the City of New York and the New York Deutschen Apotheker-Verein to act jointly in taking steps to induce physicians to refrain from prescribing "ready made identical specialties of rival manufacturers," and to omit from their prescriptions the names of makers of such preparations.

* * *

According to the *British Medical Journal* the Upper Sanitary Council of Italy has just passed an important resolution regulating the importation of patent medicines into the kingdom. A list of the foreign patent medicines admissible was drawn up, which showed that they were all French but two; to these a few more English articles have now been added. The subject is said to be engaging the attention of the British Embassy and we gather that further modifications in the regulation are probable.

Pharmaceutical Society of Ireland.

MEETING OF THE COUNCIL.

The monthly meeting of the Council of this Society was held on Wednesday, March 7, in the College of Physicians, Dublin, at three o'clock.

The President, Dr. Tichborne, in the chair.

The other members of the Council present were the Vice-President, Dr. Aquilla Smith, Dr. Montgomery, Dr. Collins, Messrs. Allen, Bennett, Brunker, Grindley, Hayes, Hodgson, Pring, Simpson and Wells.

The President said a letter had been received from Mr. Middleton, dated March 2, reminding the Council that he had not up to that date, received any answer to his communication of December 19, 1882, asking that a declaration should be accepted in lieu of a certificate. He (the President) had a visit, two or three days ago, from Mr. Middleton, who wanted to know why he had not received a reply.

The Registrar, Mr. Fennell, said he laid the matter before the Certificate Committee.

Mr. Hayes: The Certificate Committee only meets immediately before the examinations for the purpose of examining the certificates.

The President said a reply ought to have been sent to Mr. Middleton.

Mr. Allen: Mr. Fennell brought the matter before some members of the Committee informally assembled and it was arranged that I should speak to Mr. Grindley about giving him a certificate. I did so, and the certificate has since been handed to Mr. Middleton. Nothing more can be done until he sends that certificate before us.

It was resolved that Mr. Fennell should write to Mr. Middleton stating that the Certificate Committee had not met since the receipt of his letter in December, 1882; but that it would meet before the next examination, when his case would be considered; and that in the meantime he should send in any further documents relating to his qualification.

A letter was read from Mr. E. Worth, of Bournemouth, presenting some prescriptions to the Society.

On the motion of Mr. Hayes, seconded by Dr. Collins, thanks were voted to the donor.

A letter was read from Dr. A. N. Montgomery, Secretary of the Medical Section of the Academy of Medicine in Ireland, requesting the use of the Council room on an evening in each month to exhibit specimens in.

On the motion of Mr. Hayes, seconded by Mr. Brunker, a resolution was passed granting the use of the Council room on an evening in each month, provided it did not interfere with the examinations or meetings of the Society, and also provided the sanction of the College of Physicians was obtained.

A letter was read from Mr. G. T. Dobson, of 1, Gilbert Road, Kennington Road, London, stating that he proposed taking a chemist's business in Ireland, and asking for a syllabus of the subjects required in the examination of the Society; and also asking whether the licence of the Society of Apothecaries, London, would be accepted in lieu of the final examination of the Society.

The President: It does for the Preliminary examination of our Society, but that is all.

The Registrar was directed to inform Mr. Dobson that the licence of the Society of Apothecaries, London, could not, under the Act, be accepted by the Pharmaceutical Society of Ireland in lieu of its final examination.

A letter, dated March 3, was read from Dr. J. W. Moore, Registrar of the College of Physicians, Ireland, stating that a communication had been received from the Privy Council, asking whether the provisions of the Sale of Poisons (Ireland) Act, 1870, as far as regarded the sale of poisons to persons unknown to the seller, were generally observed in Ireland, and if so, whether any inconvenience had been caused thereby; and that he had been directed to ask the Council of the Pharmaceutical Society whether it would inform the College of the results of the inquiry which it was making on the subject.

The President: The way to meet that would be to send a copy of the report of our Pharmacy Act Amendment Committee.

Mr. Brunker submitted a report from the Pharmacy Act Amendment Committee of the Society. It stated that in reply to the queries addressed to licentiates as directed at the last committee meeting thirty replies had been received from twenty different localities. The answers to the first query were nearly unanimous as to qualified persons observing the provisions of the Poisons Act. The answers to the second query unanimously were that no inconvenience arose to the public from the restrictions being observed by qualified persons. The answers to the third and fourth queries showed that the sale of scheduled poisons was largely carried on by persons describing themselves as chemists and druggists, ironmongers, grocers, seedsmen and small huxters. Replies to those queries had been received from seventeen towns. Two or three of the replies stated that no such sales took place in Dublin; and a negative reply had been received from Warrenpoint. The towns from which the answers had been received included such important places as Dublin, Belfast, Limerick, Omagh, Monaghan, Mullingar and Athlone. Replies to the fifth query mentioned only three fatal cases resulting from unqualified persons selling poison, but stated that numerous serious mistakes were reported. Replies to the sixth query went to show that the police had taken some action towards seeing the provisions of the Act carried out in Dublin, Blessington and Naas, but not elsewhere.

The President: I do not think the police have taken any action, except so far as making inquiries. We know of no prosecutions for illegal sales.

Mr. Brunker: They have issued circulars and called at some places to see if poison books were kept.

Mr. Wells said that in one instance two detectives called at an establishment in Sackville Street and asked to see the poison book, and they also called at a number of other houses; but the object of their inquiries was to ascertain where the poison had come from in connection with a recent case of poisoning that had occurred.

Mr. Brunker said that since the report was drawn up a reply had come from Ballymoney stating that some action was being taken by the police there. The report concluded as follows:—

"The Committee then took up the consideration of the Poisons Act (Ireland), 1870, with the view to amend same, and suggest that the sale of proprietary or patent medicines, containing scheduled poisons, should be subjected to the following restrictions:—

"(*a*). A specification of the poisonous contents, and the quantity of same to be printed on label or wrapper.

"(*b*). The word 'poison' to be printed on the various labels or wrappers of the article, together with the name and address of the first seller.

"(*c*). The sale of such articles to be confined to persons legally qualified to sell scheduled poisons.

"The Committee also recommend the addition to Schedule II., Poison Act (Ireland), 1870, of sulphuric acid, hydrochloric acid, nitric acid, solution of chloride of antimony, and carbolic acid.

"In addition to the amendments already adopted by the Council of the Pharmaceutical Society of Ireland to the Pharmacy Act (Ireland), 1875, Committee suggest that Clause 10 of the draft Bill, proposed by the Pharmaceutical Society of Great Britain, should be adopted, with the addition 'that delivery of such notice by registered letter shall be deemed good service,' after the words 'notice signed by him.'"

The object of inserting that clause was to provide means for discovering who were the actual owners of

establishments about the ownership of which there was a doubt.

The Committee had been instructed to draft a letter to Dr. Kaye, and had prepared the following:—

"Pharmaceutical Society of Ireland.
"Kildare Street, Dublin,
"*7th March*, 1883.

"W. S. B. Kaye, Esq., LL.D.,
"Clerk to the Privy Council,
"Dublin Castle.

"Sir,—In reply to your letter of 29th January, 1883, I am directed by the President and Council of the Pharmaceutical Society of Ireland to state, for the information of the Lords of the Privy Council in England, that they have carefully considered the queries contained therein, and, having instituted inquiries among the Licentiates of the Society residing in various parts of Ireland, have to convey the following replies to those queries:—

"I. (1). The provisions of the Sale of Poisons (Ireland) Act, 1870, with regard to the sale of poisons to persons unknown to the seller, are pretty generally observed by duly qualified pharmaceutical chemists and apothecaries.

"(2). The observance of these provisions has not caused any inconvenience to the public.

"(3). But the sale of poisons is largely carried on throughout the country by general traders, such as chemists and druggists (not holding the licence of the Pharmaceutical Society), grocers, ironmongers, seedsmen, huxters, etc., and by this class of persons the provisions of this Act are generally ignored.

"This is the case in seventeen towns from which returns have been received, including Dublin, Belfast, Limerick, Omagh, Dungannon, Monaghan, Maryborough, Mullingar and Athlone —all large centres of population.

"(4). Though few fatal accidents have occurred through this indiscriminate dealing in poisons, numerous serious mistakes have been made by ignorant persons.

"(5). The returns show that in no towns, except Dublin, Naas and Blessington, have any steps been taken by the police authorities to ascertain whether the provisions of the Act are observed or not; and that no prosecutions have been instituted by them in any part of the country.

"II. In reference to the second query contained in your letter, I am to state that the President and Council recommend, for the consideration of the Privy Council, the following additional provisions for the better regulating the sale of poisons in this country:—

"(1). That the sale of proprietary or patent medicines containing scheduled poisons should be subject to the following restrictions:—

"A. A specification of the poisonous contents, and the quantity of same to be printed on the label or wrapper.

"B. The word *Poison* to be printed on the various labels and wrappers of the article, together with the name and address of the first seller.

"C. The sale of such articles to be confined to those legally qualified to sell the scheduled poisons.

(2). That the following substances be added to schedule II. of the existing Act:—sulphuric acid, nitric acid, hydrochloric acid, carbolic acid and solution of chloride of antimony.

"III. I have also to state that some difficulties and deficiencies have been experienced by this Council in the working of the Pharmacy Act (Ireland), 1875, since its enactment; and I am to bring under your notice the following considerations, with recommendations based thereon:—

"The Act conferred upon the Licentiates of this Society—

"(1). The right formerly enjoyed in Ireland by Apothecaries only, to compound medical prescriptions (sec. 30).

"(2). The right—confined to them and to Apothecaries —to retail the poisons scheduled under the Poisons Act (33 and 34 Vict. cap. 26).

"(1). The former privilege was opened up to chemists and druggists who were in business at the time of the passing of the Act; but only on their submitting themselves for examination, in accordance with the regulations of the Society.

"(2). By section 31 of the Act, such persons had reserved to them the right to sell poisons, without any restriction as to any qualification by examination, if they were engaged in that trade at the time of the passing of the Act.

"No machinery was adopted or laid down under the Act whereby such persons should be registered, nor was any line of demarcation drawn between them and others, who at some subsequent date might choose to enter upon that trade. The consequence is that the sale of poisons throughout the country is carried on without hindrance by any person who cares to engage in it.

"The Council, feeling that such a state of things should not, in the interests of the public, be allowed to continue, have adopted the following resolutions:—

"1. That it is desirable that the Council of the Pharmaceutical Society should seek powers which will enable them to compel all chemists and druggists actually engaged in the sale of poisons and poisonous drugs at the time of the passing of the Pharmacy Act (1875), on making a declaration to that effect, and giving reasonable proof thereof, to register their names, paying a fee of three guineas for same; such persons to be styled 'Registered Druggists.'

"Since these resolutions were adopted, nearly three years have elapsed, rendering the enforcement of amendment No. 1, even if it were now passed into law, much more difficult. The Council therefore think that it would be satisfactory if the privilege of registering were extended to those engaged *bonâ fide* in the sale of poisons at the present date.

"That a list of 'registered druggists' for the sale of poisons shall be published from time to time by the Council of the Pharmaceutical Society, containing the names and addresses of all persons entitled to be placed thereon.

"3. That it shall be illegal for any person to sell poisons or poisonous drugs, or to style himself a 'registered druggist,' except he shall be so registered, save and except he be a registered medical practitioner, or duly registered by the Pharmaceutical Society of Ireland, or otherwise qualified under the provisions of the Pharmacy Act.

"4. That it shall be unlawful for any registered druggist, or other person, to keep open shop for retailing, dispensing, or compounding medical prescriptions, unless he be registered as a pharmaceutical chemist, or apothecary.

"5. That the penalties for infringement of this Act shall be the same as provided in the Pharmacy Act.

"6. That all bye-laws or rules for registration shall be approved of by the Privy Council prior to their adoption.

"Some inconvenience has arisen under Clause 11 of the Act, from the short interval allowed for filling occasional vacancies on the Council, to meet which the following amendment is suggested:—

"After the word 'Society' (line 3) read:—'Such day not to be later than the next monthly meeting after the vacancy has been notified to the said President.'

"The following amendments have also been adopted by the Council, and I am to recommend them for the consideration of the Privy Council:—

"That in reference to the Pharmacy Act (Ireland), 38 and 39 Vict. cap. 57, and more especially in reference to Clause 30 of same, the word *person* shall be held

to mean and imply any association of persons, whether as a partnership, society, or company (limited or otherwise), of which one or more members shall not be qualified under the provisions of the Act.

"That the Society shall have powers to institute an Examination for Assistants to Pharmaceutical Chemists.

"That no pharmaceutical chemist shall legally hold any establishment for the retail of poisons, or compounding of medical prescriptions, except under the responsible management of a duly qualified pharmacist.

"This Council further recommend the extension to Ireland of Clause 10 of the draft Amendment Bill proposed by the Pharmaceutical Society of Great Britain, adding after the words 'notice signed by him,' 'the delivery of such notice by registered letter to be held sufficient service.'

"I have the honour to be, sir,
"Your obedient servant,
"H. J. FENNELL,
"*Registrar.*"

On the motion of the Vice-President, seconded by Mr. Pring, the report was adopted.

On the motion of Mr. Bennett, seconded by Mr. Grindley, it was ordered that fifty copies of the draft letter to Dr. Kaye be printed, and that a copy of it be sent to the College of Physicians of Ireland.

On the motion of Mr. Allen, seconded by Mr. Grindley, it was ordered that all the replies received to the queries which had been addressed to licentiates should also be sent to the College of Physicians.

Mr. Henry Forewell, of 53, Lower Sackville Street, Dublin, was elected a member of the Society.

The following donations were announced :—

The Year-Book of Pharmacy for 1882.
From the BRITISH PHARMACEUTICAL CONFERENCE.

The Calendar of the Pharmaceutical Society of Great Britain for 1883.
Presented by that SOCIETY.

Fourteen volumes of Curtis's 'Botanical Magazine.'
Presented by the Registrar, Mr. FENNELL.

The thanks of the Council were voted to the donors.

The Council then adjourned.

Provincial Transactions.

SHEFFIELD PHARMACEUTICAL AND CHEMICAL ASSOCIATION.

DISCUSSION ON "THE PHARMACY ACTS AMENDMENT BILL."

In response to an invitation from the Council of the Sheffield Pharmaceutical and Chemical Association, a meeting of members and the trade was held in the Society's rooms, Market Place, Sheffield, on Wednesday, March 7, to discuss "The Pharmacy Acts Amendment Bill now or about to be introduced into the House of Commons." Mr. J. Preston (President of the Society) occupied the chair.

The President said that the meeting had been called at the instigation of the Council, and said there had been meetings held in other towns in connection with the question which would form the subject of discussion that afternoon. It was proposed that the preamble of the Bill as published in the *Pharmaceutical Journal* of February 10 should be read, and the clauses discussed one by one. He would ask them to consider the Bill broadly, remembering that Acts of Parliament were not made for individuals, but for communities, and he trusted that they might have a wise and fair discussion of the several points in the Bill.

Mr. Newsholme (Hon. Sec.) then read the preamble of the Bill.

Mr. J. M. Furness rose to move that the word "poisonous" in the second line of the preamble should be omitted, remarking that clause 2, specifying the "regulations to be observed in the sale of poisonous articles," appeared to him to be the most objectionable in the whole Bill.

Mr. W. Ward asked if Mr. Furness proposed to leave out the word "poisonous" and substitute some other word.

Mr. Furness said he proposed to omit the word "poisonous" and put the word "dangerous" in its place. He then moved to that effect.

Mr. Learoyd seconded the motion.

Mr. Ward moved as an amendment that the word "poisonous" should remain in the preamble.

The President stated that a simple negative would suffice, and he then put the resolution moved by Mr. Furness, which was carried, 8 voting for and 3 against it.

The preamble was adopted with the alteration.

Clause 1, as simply a definition clause, was agreed to without discussion.

Clause 2. *Regulations to be observed in the sale of poisonous articles.*

Mr. E. R. Learoyd remarked that clause 2 referred to a number of articles to which for the first time since the passing of the Pharmacy Act a condition had been provided for the sale of articles which were no doubt poisonous, but which should be sold by others than registered chemists. The reason that clause had been introduced into the Draft Pharmacy Bill was this. Some time ago a number of men interested in agriculture and in the keeping of horses,—such men as stud farmers and stud keepers,—found great injury done to their stock by maladministration of those very deleterious and injurious bodies which were easily obtained by horse-keepers and grooms. It was felt that this was a great injustice, and it was suggested by the Pharmaceutical Society that these poisons should be added to the second part of Schedule A in the Pharmacy Act of 1868, which would render their sale liable only by registered chemists, who would have to label them "poison" in the ordinary way. When the Pharmaceutical Society represented this to the Privy Council it was clearly shown that the Government would not entertain that suggestion, as these drugs were largely used in manufactures. They would not entertain the idea of restricting the sale to chemists alone. In the Draft Pharmacy Bill, therefore, in order to cover and protect the people injured thereby, this clause had been inserted as a sort of compromise, and it had become necessary in the opinion of the Pharmaceutical Society instead of having them placed on the list of poisons that they should be marked "poisonous," as they could be sold by any dealer. The resolution he should propose referred to the last article in the schedule of poisonous articles; he spoke more particularly of carbolic acid. So far as they had any information with regard to this particular drug it was not used in manufactures. He also believed he was correct in stating that this article was largely used for medicinal purposes and appliances, and he did think that when the Pharmaceutical Society considered it necessary to have these things labelled "poisonous" it would be wise to place carbolic acid in the list of "poisons" to be marked with the name of the seller, and sold by chemists only. Numerous mistakes had occurred in hospitals and elsewhere in applying the article, and he moved that the second clause be adopted with the exception of the article carbolic acid, recommending that it should be placed in the second part of the Schedule A of the Pharmacy Act of 1868, to be sold by chemists only.

Mr. A. Archer. in seconding the motion, said that in his opinion carbolic acid should be placed in the list of poisons only to be sold by registered chemists and druggists. It was, he said, a mistake to include it in the list of "poisonous" articles.

Mr. H. E. Ibbitt said he should like to ask if there was any legal distinction between a poisonous article and a

poison. He could not conceive of any. He had looked in Taylor's 'Medical Jurisprudence,' and there he found only poison defined. If the word "poisonous" had any use at all it meant a minor form of poison. The articles proposed to be included in the schedule were not minor forms of poison, though they were deadly, if he might use such a word. If the Act was passed it would place them in this position, that suppose a customer came for a pennyworth of paregoric in half a pint of vinegar they must put "poison" on it, but if he wanted oil of vitriol or nitric acid they must label it "poisonous," which meant that it was not a strong poison. It might come to a question as to which were "poisons" and which were "poisonous" articles.

Mr. Learoyd said he thought he should be able to show that the Act of 1868 very clearly defined what were "poisons," and that the present clause defined what were "poisonous."

Mr. Ibbitt thought the word "poisonous" should be left out altogether.

Mr. W. Ward said it was quite well known, and had been clearly explained, that the Council was not able to add to the schedule of poisons the acids mentioned along with carbolic acid. The Privy Council rejected them, and no doubt they had strong reason for putting carbolic acid along with the other acids. He thought they should give the Council credit for what was no doubt a judicious plan. On that ground he was not prepared to support Mr. Learoyd's motion.

Mr. J. M. Furness said he was prepared to move that the whole of clause 2 be expunged from the Bill. They had been told by Mr. Ibbitt that the articles proposed to be added to the schedule were not merely "poisonous" but poisons. The Pharmaceutical Society itself, when asked to represent their opinions to the Government, said these very articles should be placed in the second section of Schedule A of the Act of 1868; yet it was now proposed they should be labelled "poisonous." Were they to understand that this very objectionable clause was to be a sop for the whole Bill. If they voted now that those articles should be labelled "poisonous" they would stultify their opinions of last year, and he maintained that if the Privy Council wanted this clause let it have it on its own responsibility. No chemist sold those articles without labelling them poison, and the public was safe if they were exclusively in the hands of the chemist. Therefore he asked why they should bind themselves to the Privy Council in order to do objectionable work which was against their own opinions of last year.

Mr. J. Ellison said that he objected to other people besides chemists and druggists selling poisons, and he thought the Privy Council ought to restrict the sale of them.

The motion, upon being put, was carried, 10 voting for, and 4 against it.

Clause 3.—*Regulations on sales by wholesale of poisons in part* 1 *of Schedule A to the Pharmacy Act of* 1868.

Mr. Ellinor said he thought the wholesale houses should be registered as wholesale dealers, that there should be a register of wholesale druggists.

No other remarks were made on this clause, which was agreed to.

Clause 4.—*Labelling of patent medicines being or containing a poison.*

Mr. Learoyd said he should be sorry indeed if they, as representing in some slight degree a branch of the Pharmaceutical Society, let it go forth to the public that they were at all selfish in their views. It was the greatest mistake in the world to suppose that they, as a branch of the Society, or that the Pharmaceutical Council representing the great mass of pharmacists, wished to legislate with any selfish views whatever. The principle they desired to lay down and promulgate was that they as a society were bound to legislate for the public good, and in taking that view they were bound as a body to protect the public from the use of articles people did not quite understand. The word "poison" was distinctly placed here with the object of stating most clearly that the "poison" meant one of those articles contained in Schedule A of the Pharmacy Act of 1868, in distinction from other things which the Privy Council said had a right to be sold to the public at large, but which by improper use would be dangerous. He moved that the clause be adopted.

Mr. Ward seconded the motion.

Mr. Furness moved as an amendment that the inside should be labelled "poison," as well as the outside, believing that this was necessary for the public safety.

Mr. Learoyd said the clause took that precaution, and he read a portion of it, pointing out that it would be unlawful to sell "unless the box, bottle, package or vessel in which the same is contained, the wrapper, if there be only one, or the outermost wrapper, if there be more than one, be labelled."

The President said the clause seemed a little ambiguous on the point, but he thought so long as the word "poison" was placed on the outside wrapper there need be no other label, because the word "or" instead of "and" was used in the clause.

Mr. Ellinor considered that the clause should be more definite, and suggested that the part should read "unless the box, bottle, package or vessel in which the same is contained, *and* the wrapper, if there be only one, or the outermost wrapper, if there be more than one, be labelled."

Mr. Learoyd thought the word was quite unnecessary.

The clause was agreed to, with the addition of the conjunction suggested.

Clause 5, which provides *Penalties for certain offences,* was agreed to.

Clause 6.—*Duly qualified keepers of open shops entitled to remedies in certain cases.*

The President said this was a very important clause, rendering, as it did, chemists liable for things over which they had little or no control.

Mr. Ward remarked that in his opinion this clause contained a very mischievous principle. He should have been much better pleased to see the fine made on the manufacturer, or the proprietors of the article. It seemed to him that if the seller, through no fault of his own, was to be continually dragged up before the justices for selling these articles, of the non-labelling of which he might be perfectly ignorant, he was likely to get into litigation most damaging to his reputation. He therefore moved —"That the manufacturer be sued for the fine, and not the seller."

Mr. Ellinor was much surprised that Mr. Ward should oppose this principle in the clause. It was the very principle upon which the life and existence of the Adulteration Act depended. They could not go to the proprietor in the first case; they must go to the seller, as in the Adulteration Act. They would never be able to get a conviction if they went to the proprietor first; indeed they might not know who he was for long enough.

Mr. Learoyd wished to support Mr. Ward in his idea, but not in the method in which he proposed his resolution. They had, he contended, quite hardships enough to suffer in the present exigencies of their condition, without having them amplified. Perhaps it might meet Mr. Ward's view if he put the matter in this way,—"That in case a seller is summoned for selling poisons not duly labelled, on his showing that he obtained them direct from the manufacturer or wholesale dealer, the manufacturer or wholesale dealer shall be rendered liable to this penalty and costs."

Mr. Ward expressed his willingness to accept this resolution, which he moved.

Mr. Furness pointed out that the seller frequently did

not know the contents of the patent medicines he had for sale, and said he could only make himself safe by labelling every patent medicine in his shop "poison."

The President observed that under the Adulteration Act, the retailer was always summoned, and power given into his hands to deal with persons from whom he obtained the article. But supposing a bottle of chlorodyne came from the manufacturer. It was quite possible the label might fall off in the chemist's shop. Now was the manufacturer of that article to be summoned because it had not the word "poison" upon it?

Mr. Ward said the bottle would have the word "poison" upon it beneath the wrapper.

Mr. Hall presumed that if the bottle were wrapped up the label could not fall off.

Mr. Ward maintained that it would be exceedingly annoying for the vendor to be in fear of being dragged up before the magistrates, of being fined, and having his name made prominent. He might be subjected to this annoyance frequently, and that was his objection to the seller being made liable.

Mr. Hall had pleasure in supporting Mr. Ward on that point, at any rate.

Mr. Archer asked one question as to the liability of the manufacturer and wholesale dealer, how they were to get their penalties in the case of patent medicines imported from abroad—from France and America.

Mr. Learoyd pointed out that the wholesale dealer would be liable.

Mr. Ellinor asked if they got these medicines direct from the foreign makers how they were to manage about getting the penalty. Were they to go abroad to prosecute? In his opinion they would get no conviction at all. Would not the clause as it stood make those who dealt in patent medicines more careful what they supplied?

Mr. Ward's motion, having been seconded, was put to the meeting, and carried, 9 voting for it, and 4 for the clause as it stood.

Clause 7.—*Persons keeping open shops to be liable for their assistants, apprentices and servants.*

Mr. Learoyd asked whether it was fair in clause 7 to say the master was to be rendered liable for any accident or mistake of his assistants, and in the next breath, in clause 8, to say the chemist was compelled to employ a qualified man, and yet, although employing a qualified man, he himself was to be liable to the penalties. He moved that clause 7 be struck out, thinking it a hardship that chemists should be trammelled with this liability for the accidents and mistakes of their *employés*.

Mr. Ward said they would like the clause to be expunged, but it was impracticable.

Mr. Ellinor believed the clause was a greater gain than a loss.

Mr. Furness suggested an addition to the effect that the qualified assistant at the branch shop should be answerable for his own doings.

Mr. Archer considered this a proper suggestion.

Mr. Fox seconded Mr. Learoyd's motion.

Mr. Ellinor moved as an amendment that the clause be retained in its entirety. They could not, he remarked, do away with their responsibility, whether the clause was expunged or not; but seeing that the latter part of the clause would be of great service in administering the Act, he thought they had better retain the clause as it stood.

Mr. Ward seconded Mr. Ellinor's amendment.

The voting was then taken, with the following result:—For Mr. Ellinor's amendment, 11; against, 2.

Mr. Learoyd's motion was therefore declared lost.

Clause 8.—*Regulation for conducting branch businesses.*

Mr. Learoyd then moved that clause 8 be struck out. He did so, he said, because it was perfectly clear that the object of the clause was to make the proprietor of the shop responsible for acts committed in that shop, and it said nothing about how many branch shops he had. According to the clause if he had a qualified assistant in each he would still be liable. There might be some other meaning hidden in the clause, something they did not understand; but if the hidden meaning was one relating to the question of co-operative stores, and to meet that part of the question, he maintained that it was perfectly absurd to suppose it did anything of the kind. When clause 10 came on he should submit that that met the case of the co-operative societies quite fully, and that clause 8 was a great hardship.

The President said this was a very important clause, and he hoped somebody would be found to second the motion, so that there might be some discussion. There were a lot of people in the business who were not registered chemists and druggists; it was true they had the privilege of becoming registered, and of passing the Modified examination. Still, there were a number of older people who had not been registered, and to them he was afraid this clause would be rather a hardship.

Mr. Fox seconded the motion in order to facilitate discussion.

Mr. Ellinor thought they had in this clause a great provision of safety. Of course, if a person took fifty branch shops he took fifty responsibilities. He believed if the clause was expunged they would have a lot of difficulty. If a man wished to have an open shop he must have a qualification, and for every branch shop he must have a qualified assistant. It was so in the Irish Pharmacy Act and he did not see why they should not have it with the English Pharmacy Act. If men would take these extra responsibilities they must be prepared for the consequences or responsibilities they assumed. By the Act of 1868 everybody had an opportunity of becoming registered; people were crammed like turkeys, and put through their examinations like wildfire. He saw no hardship in retaining the clause, and moved that it stood in its entirety.

After some further remarks from Mr. Learoyd and Mr. Ellinor, the discussion was continued by Mr. Ward, who said with respect to the question of the proprietor of a shop and a co-operative store, there was a marked difference. The proprietor of the chemist's shop was a registered pharmacist, and must be a registered man; the members of a co-operative store were not registered men. And there was a difference between the registered man employing a qualified assistant, and a co-operative store, not registered, employing a qualified man. The owner of the branch shop having a qualified man should be held responsible for his assistant, and he therefore supported the clause as it stood, believing it was one of the most sensible and best calculated to benefit not only the cause of pharmacy, but to protect the public.

The President then put the question to the meeting. Only 2 gentlemen voted for Mr. Learoyd's motion, and 11 against it.

Clause 9.—*Duly qualified persons to sell medical prescriptions and sell poisons.*

Mr. Learoyd pointed out that the Pharmacy Act of 1868 referred to the poison clauses, and the amendment to that Act merely related to additions to those clauses.

Mr. Archer, quoting a portion of the clause, "provided nevertheless that nothing in this section shall extend to or interefere with the business of wholesale dealing in patent medicines," said Messrs. Birks, of that town, were wholesale dealers in patent medicines. Would the clause extend to them?

Mr. Learoyd said the clause referred to selling by retail, and he was not aware that wholesale dealers were supposed to sell retail.

Mr. Furness suggested an addition to the clause to the effect that all dealers, wholesale and retail, in any of the poisons in the schedules of 1868, should be qualified as registered chemists and druggists.

Mr. Ward was afraid that would never be carried.

Mr. Ellinor said he would have them all registered if he possibly could, but there was a great doubt about it.

Mr. Furness thought not with regard to poisons.

Mr. Ellinor remarked that they could not have all the wholesale druggists registered and he did not see how they could go on with the suggestion.

The clause was then agree to.

Clause 10.—*Persons having open shop must, on application, inform the Registrar of the name or names of proprietor or proprietors.*

Mr. Learoyd said that this clause was one with which he had a great deal of sympathy. It met the case clearly and comprehensively. If it became an Act of Parliament it would settle the store question finally. At the same time he must say this was the clause on which he should have relied if they had expunged clauses 7 and 8. If this clause 10 became law and they were subjected to its restrictions, he could not help thinking that in years to come some of them would arrive at the conclusion that it would have been better to take his advice with regard to clause 7.

The President said they knew the difficulty the Pharmaceutical Society had experienced in ascertaining the names of proprietors of shops where nefarious practices had been carried on. He supposed it was to meet these cases that the clause had been framed.

Mr. Ellinor said if Parliament would only adopt it, the Society would no doubt make great use of the power given by the clause.

The clause was then agreed to.

Clause 11.—This clause was agreed to without discussion.

Clause 12.—*Regulations may be made by bye-law to subdivide examinations, etc.*

The President observed that this was the educational part of the Bill. They had, as a local association, given their opinion on the question a little time since.

There was no discussion, and the clause was adopted.

Clause 13.—*Certificates of having passed Preliminary examination requisite to apprenticeship.*

Mr. Archer remarked that this clause said that no pharmaceutical chemist should take as an apprentice any person who had not obtained a certificate. Assuming that any chemist took a youth who was not legally bound, he contended that youth was not an apprentice. Apprenticeships were getting shorter, and the time might come when they would be materially altered. Now they heard of people who had passed no examination, served no time, never been bound to a master. It ought to be absolutely defined that youths entering the trade in this way were not apprentices.

Mr. Ward asked how he would define it.

Mr. Archer, continuing, said he might find a youth who was suitable and take him on verbal conditions, but he would not be an apprentice. He might remain to the end of four years, and yet he would not be an apprentice. In such a case the matter would be left open.

The President remarked that it would be an evasion.

Mr. Archer, continuing, observed that the word "apprentice" would have to be defined. Then there was another matter. In clause 8 were the words "a duly qualified keeper of an open shop." Any shopkeeper who was not a chemist and druggist might say he was "a qualified keeper."

The President said a definition of "a qualified keeper of an open shop" was given in the former Bill. Certainly no person was "duly qualified" unless he had passed.

Mr. Archer admitted that in that case it was all right, but with regard to the word "apprentice" they should have it defined.

Mr. Learoyd said there was a clause in the bye-laws which set forth distinctly that no person was eligible for examination until he had served three years with a qualified chemist.

Mr. Archer remarked that if that was so they were all right.

Mr. Ellinor said Mr. Archer was probably not aware that each student must have a certificate showing that he had served three years, and that the youth would have to serve three years after he was registered before he could present himself for examination.

Mr. Fox asserted that the clause would not interfere with a chemist having a boy in his shop. It was merely that the apprentice must pass his Preliminary examination before he stayed three years for the Minor examination.

Mr. Ward pointed out that the youth would have to stay three years between passing the Preliminary and passing his Minor examination.

The President, by way of illustration, said if he took a boy for two years and gave a certificate that the lad had been three years as an apprentice, then he should render himself liable to the extent of £5 or £10; but if he took a youth who was not apprenticed, but was merely serving his time as a porter or servant, not wishing to enter the trade, he could not give that youth a certificate.

Mr. Learoyd said the word in the clause was "previously," meaning that a man should not take an apprentice until he, prior to the commencement of his apprenticeship, passed this Preliminary examination.

The clause was adopted without further discussion.

Clause 14.—*Certificates may be accepted in lieu of Preliminary examination.*

The President said he only wished other bodies would imitate the Pharmaceutical Society with regard to the liberality shown in that clause.

The clause was agreed to.

Clause 15.—*Certificates of death and expense of same.*

This clause was adopted without discussion.

Clause 16.—*Certain persons to be registered as Pharmaceutical Chemists and eligible for membership.*

The President said he took it that this clause was a position taken up by the Pharmaceutical Society with the object of continuing its existence. It was a lengthening of its stakes, and a strengthening of its cords.

Mr. Ellinor observed that this was not the time when he should take strenuous opposition to this clause, although he did not see there was any advantage to be gained. It seemed as if the assistant qualification of the Society qualified a person as a chemist, and the Minor examination qualified for a pharmaceutical chemist. But the Society had not provided anything for those who had borne the heat and burden of the day. Nothing was said for those who had worked for progress. He thought it was wrong to take away the title of pharmaceutical chemist without giving him, who had passed all the examinations, another title. He thought there should be some distinction for those who had worked upward in this way. This clause had a double action, and referred to attendance on juries. The chemists and druggists were desirous of getting rid of this jury service if they possibly could, and this section would give the means to every chemist and druggist who qualified after the time named to get rid of the jury service. But those who were chemists and druggists under the present Act would have to remain on juries. What he objected to was that nothing was being done for those who had passed the examinations. He thought a time would come when they would have to have a fellowship.

Mr. Ward thought Mr. Ellinor was mistaken. That gentleman referred to the Minor examination as qualifying for a pharmaceutical chemist, but the clause did not say so.

Mr. Ellinor read the clause, and believed he had interpreted it rightly.

Mr. Ward said it did not necessarily follow that the Minor examination was meant; indeed, he did not think the Council had the remotest idea of making the Minor examination an entrance for the degree of pharmaceutical chemist. Looking at the matter from a broader standpoint, he was bound to confess that it would be a wise and judicious course to take. At present it was confusing to the public, who were not able to distinguish between the Minor and Major examinations. Mr. Ellinor had referred to the Irish Pharmacy Act. They had two

examinations—a Preliminary, and a Pharmaceutical; and he thought the proposed change would not only advance the cause of pharmacy amongst themselves, but in the eyes of the public. He was glad they were going to show a liberal spirit and admit all as pharmaceutical chemists.

Mr. Learoyd said those who were aware of the inner working of the Pharmaceutical Society were prepared to see a very amended scheme of examinations, and he believed the examination of "chemists and druggists" would not be the examination chemists would have to undergo to be placed on the Register of Pharmaceutical Chemists.

Mr. Furness was certain the Minor examination was stiff enough for chemists to pass at any time. He felt inclined to move that these examinations should be placed under the authority of the Privy Council. The Pharmaceutical Society were a very go-a-head people. They had an idea that everything was to be tested by examinations; but the Minor examination was strict enough for anyone to pass who wished to qualify as a chemist and druggist. The objection he had was that the people who passed the Minor were to be raised to be members of the Pharmaceutical Society. If the Bill became law those who passed the Minor examination would be pharmaceutical chemists and those who had passed it previously would be simply chemists and druggists. It was manifestly unjust that the man who passed the Minor examination before the Act came into force should be in an inferior position to the person who passed the examination after it came into force. It was also unjust to the Major men who had qualified as pharmaceutical chemists that the persons who only passed the qualifying examination should be able to assume their title.

Mr. Ellinor also thought it would be a great injustice.

Mr. Archer thought all who passed the Minor were going to be pharmaceutical chemists and that they were going to abolish the Major. If that was the case, he considered it would be quite as fair to take them all in.

Mr. Ibbitt asked what would happen to those who were in business before 1868?

It was pointed out that the next clause dealt with such chemists, and clause 16 was then agreed to.

Clause 17.—*Certain persons to be eligible for membership.*

Mr. Learoyd moved the adoption of this clause, and said that from 1841, when the first Act passed, until 1852 the method of obtaining entrance to the Pharmaceutical Society was not by examination but by subscription only. And although that had been the foundation of the great success of pharmacy in these dominions, they must consider that those gentlemen who had by reason of examinations become chemists and druggists were to be placed on a par with gentlemen who passed none at all. Those who commenced this great work were already passing away, their subscriptions were ceasing, and it would be necessary from a pecuniary point of view that somebody should step in their shoes and support the Society. He thought it a very proper thing that this clause should take effect, and he also thought there would be a sufficient distinction that these chemists would only become members of the Society while the pharmaceutical chemists, attaining the high position to which Mr. Ellinor had referred, might obtain a fellowship.

The clause was agreed to.

Clause 18.—*Certain claims for registration not valid unless made before January* 1, 1885.

This clause was agreed to without comment.

Clause 19.—*Repeal of Section XI. of Pharmacy Act,* 1852, *and Section XX. of Pharmacy Act,* 1868.

Mr. Learoyd stated that in 1869 an amended clause was inserted by which any medical man could commence business and be registered under the Act if he had passed the pharmaceutical examination in conjunction with his medical examination.

The clause was adopted without further remark.

Clause 20.—*Penalties under Act not to exempt from other penalties;*

Clause 21.—*Penalty for wilful falsification of register, or for obtaining registration by false representation;* and

Clause 22.—*This Act shall not extend to Ireland;*—

were agreed to without discussion.

Clause 23.—*Commencement of Act.*

Mr. Learoyd said he rose to propose a resolution. The spirit of the clause was perfect with one exception. It was intended the Act should come into force on January 1, 1884. In clause 8 they had already decided that no person should have a branch shop without having a qualified assistant. In many cases throughout England and Wales chemists had not only one but several shops, and the question arose whether in the time stated they would be able to get a sufficient supply of qualified assistants. It would be an unaccountable hardship, and he was sure one never intended by the Pharmaceutical Society, if chemists were liable to a penalty, although it might be impossible to obtain a qualified assistant in the time specified. He therefore moved that the Act should come into force as stated, with the exception of clause 8, which should come into force on and after January 1, 1886.

Mr. Furness submitted that the resolution was out of order, and that it should have been proposed previously.

Mr. Learoyd said this was a question of date, and he could not see why it was not applicable to the question of date in the Bill.

The President thought it would be in order to consider the question of date.

Mr. Archer seconded the amendment, saying he was not personally interested in branch shops, and did not wish to be, but he thought the suggestion thrown out was quite to the point. It did not seem quite fair that people having branch shops should be expected to get qualified assistants in such a short time, and he was in favour of the period being extended to January 1, 1886.

Mr. Ward moved—"That the clause remain as it is."

Mr. Ellinor seconded the amendment, remarking that the Pharmaceutical Society would not draw a hard and fast line, or begin to take proceedings against persons without giving them an opportunity to get qualified assistants.

Mr. Learoyd said the Pharmaceutical Society were expected to be guided by the Act of Parliament. Even though they were as lenient as possible other persons might take action, and he looked upon this short period as a serious objection.

The amendment was put—4 voting for it, and 8 against it.

The discussion on the Bill being concluded, Mr. Learoyd said he rose to express the gratification he felt at the very able manner in which the President had conducted the business. He then moved a vote of thanks to the President.

The resolution was seconded by Mr. Hall, and supported by Mr. Ellinor, and carried.

The President, in acknowledging the vote, complimented the meeting on the celerity and thoroughness with which it had dealt with the various clauses, and the proceedings concluded.

EDINBURGH CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

The eighth meeting of the session was held on Wednesday, February 21, in the rooms of the North British Branch. Mr. William Aitken in the chair.

The minutes of the last meeting having been read and adopted, the Chairman called upon Mr. J. MacGlashan to read a paper on "The Manufacture of Alcohol."

The paper was illustrated by an interesting series of

specimens showing the stages in the process of manufacturing alcohol from grain, and a microscopic slide showing the yeast plant (*Torula cerevisiæ*).

On the motion of the Chairman, seconded by Mr. MacEwan, a cordial vote of thanks was awarded to Mr. MacGlashan.

The discussion which followed was taken part in by Messrs. Crowder, Fraser, MacEwan and Hill.

The ninth meeting of the session was held on Wednesday, March 7, in the rooms, 119A, George Street. Mr. P. Boa, President, in the chair.

The minutes of last meeting having been read and confirmed, the Chairman called upon Mr. W. Pirie to read a paper on "Chloral."

The paper will be published in a future number.

Mr. Pirie exhibited specimens of chloral, chloral hydrate, chloral alcoholate and chloral sulphydrate, and on the motion of the Chairman, seconded by Mr. J. D. Robertson, he was awarded a hearty vote of thanks.

A discussion followed, in which Messrs. Boa, Crowden, Henry, MacEwan, Robertson and Hill took part, the latter giving a practical illustration of Ogston's ammonium sulphydrate test for the detection of chloral, butyl-chloral and croton chloral.

Mr. W. S. Turnbull then started a discussion on the new Pharmacy Act Amendment Bill, and gave notice of the following motion for the next meeting, which was fixed for Wednesday, March 21, viz.:—"That this Association, while giving its cordial support to the larger portion of the Pharmacy Acts Amendment Bill, cannot overlook the desirability of having a common title for all who have or may become qualified by examination prior to and after 1886, and would respectfully urge upon the Pharmaceutical Council the necessity for deleting the following from clause 17:—'But no person shall in right of membership acquired pursuant to this clause be placed on the Register of Pharmaceutical Chemists,' and the following words be added:—'And shall be entitled to be placed on the Register of Pharmaceutical Chemists.'"

The Chairman having intimated that at the same meeting a paper would also be read on "The Alimentary Canal," the meeting was closed.

Proceedings of Scientific Societies.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of this Association was held on Thursday, March 8, Mr. H. G. Greenish, Vice-President, in the chair.

Mr. E. Baily read a "Note on Dried Alum," which will be published in a future number of this Journal.

A discussion followed the reading of the paper, in which the Chairman, Secretary, and Messrs. Crow, Corder, Parker, Thompson and Short took part.

A vote of thanks was passed to Mr. Baily for his paper, which had been worked out with the aid of a grant from the Research Fund.

The Reporter upon Analytical Chemistry, Mr. C. Thompson, then made a report upon the "Separation of Cadmium and Copper."

A discussion followed the reading of the report, in which the Chairman, Secretary, Messrs. Crow, Parker, Ransom, Rees and Short took part, after which—

Mr. F. W. Short, the Reporter upon Inorganic Chemistry, made a report upon "The Alkali Manufacture." Various processes were described for converting NaCl into Na_2CO_3, but those chiefly dwelt upon were the Leblanc and ammonia processes. Special attention was devoted to the reactions which occur in the intermediate stages of the Leblanc process, with regard to some of which there is a difference of opinion among various authorities. The different methods proposed from time to time for the recovery of sulphur from the bye-products, or for their utilization in other ways, were reviewed, and the most important of them, including the Schaffner and Helbig process for recovering sulphur, were fully described. The report concluded with a description of the ammonia process, and details of the most recently published modifications and improvements.

In the discussion that followed the Chairman, Secretary, Messrs. Crow, Parker, Ransom and Thompson took part.

CHEMISTS' ASSISTANTS' ASSOCIATION.

At a meeting of the Association on Wednesday, February 21, Mr. C. Thompson read a paper on "Lithiæ Citras," which will be published in a future number.

After a discussion, in which several members took part, a vote of thanks, proposed by Mr. Cracknell, and seconded by Mr. Billson, was given Mr. Thompson for his valuable paper.

Another meeting of the Association was held on Wednesday, February 28, Mr. W. A. Wrenn in the chair, when a paper on "Tobacco of Commerce" was read by Mr. C. E. Palmer.

Mr. Palmer divided his subject into two divisions, viz., unmanufactured and manufactured tobacco. Under the first division he gave a brief description of the most important species of the tobacco plant, including *N. tobacum*, *N. rustica* and *N. repanda*, pointing out that *N. repanda* is not now to be found either wild or cultivated in Manilla. He then proceeded to give the history of the tobacco plant and of smoking, referring to Sir Walter Raleigh and his companions as being the first to introduce the practice of smoking into England in 1586. The collection of the leaf and preparation of it for the market was next spoken of. Lastly, its chemical composition and medicinal uses were treated, Mr. Palmer saying that he thought the use of tobacco as a medicine was nearly obsolete, for having been for ten years actively engaged in dispensing, he had only had occasion to dispense any preparation of tobacco three times. Under the division of manufactured tobacco, the laws regulating the manufacture and sale of tobacco were enumerated, and the operation of cutting tobacco, making cigars and snuff were fully explained. The enormous revenue derived from tobacco and snuff was stated, also the adulteration to which tobacco is subject, the latter being illustrated by drawings.

A lively discussion followed, in which the President, Messrs. Alcock, Braithwaite, Coe, Cracknell, Kerr, Park, Parkinson, Thompson, Woods and Millhouse took part.

A vote of thanks to the author was proposed by Mr. Winfrey and seconded by Mr. W. T. Cooper, jun.

A meeting of the above Association was held at the rooms, on Tuesday, March 6, when a paper, on "Photography," was read by Mr. C. F. Wyatt, who commenced by giving the history of the early processes which led to the practice of photography in its present form, with a short description of the more important ones, including those of Wedgwood, Niépce and Daguerre. The more recent wet-plate process was described, and the difficulties met with by the wet-plate worker mentioned, after which, the different dry-plate collodion and gelatine processes were described, and details given of the manufacture and use of gelatine dry plates. Printing and toning were described, and the precautions necessary in order to obtain permanent pictures commented upon.

The paper was illustrated by specimens taken by different processes, and after a lengthy discussion, in which the President, Messrs. Crow, Fell, Glow, Thompson, Millhouse and others took part, a vote of thanks, proposed by Mr. W. E. Crow and seconded by Mr. Palmer, was given to Mr. Wyatt.

Parliamentary and Law Proceedings.

Alleged Poisoning by a Cough Mixture.

Mr. F. Price, district coroner, has held an inquiry at the Murraytown Liberal Club, Cheetham, respecting the death of a child named Minnie Rendle Wilson, three months old. The evidence of the mother and grandmother showed that the child was a full-grown and healthy one up to Friday, when it caught cold and commenced to cough very badly. Mrs. Wilson applied bran poultices to its chest, which gave the child temporary relief. On Saturday afternoon, however, the mother went to the shop of Mr. C. G. Breadnor, chemist, 256, Waterloo Road, Cheetham, where she purchased a small bottle of "Breadnor's celebrated cough mixture." The deceased was given half a teaspoonful in a little warm water about half-past 10 o'clock, another dose was administered at half-past 2, another about half-past 5, and a fourth about half-past 8 on Saturday evening. The child slept all the following day till about half-past 11, when it became very bad, and Dr. Husband was sent for. On arriving at midnight the doctor found that the deceased had died a few minutes previously.

Dr. W. E. Husband said he examined the child, and there were no marks of violence upon the body, but the appearance of the eyes showed symptoms of poisoning. He took the medicine bottle with a portion of the medicine in it to Mr. Breadnor, and asked him what it contained. Mr. Breadnor showed him the prescription from which the mixture was made, and from that it appeared that it contained morphia. The bottle would hold about sixteen doses, and the child had had doses which would have about the 1-32nd part of a grain of morphia, which would be more than sufficient to cause the death of a child of that age.

The Coroner: Have you any doubt that the death of this child has been accelerated by the taking of this mixture?

Dr. Husband: I have no doubt whatever.

The Coroner: And in fact had not this mixture been taken and the child been properly treated it might probably have been alive?

The Doctor: Yes.

In answer to a juryman, the Coroner stated that the description on the label of the bottle stated that the mixture was "for children under six months old; half a teaspoonful in the same quantity of warm water every three hours."

Mr. Price said there could scarcely be any doubt that the child had died from an overdose of this medicine, which had been administered innocently enough on the part of the mother and grandmother. Mr. Breadnor had sold it in the ordinary course of his business, and he (the Coroner) did not know that any fault could be found with him, for if people would purchase these medicines and administer them indiscriminately it could not be helped. He thought, as the doctor had said, that it was a dangerous practice to give narcotics to very young children.

The Jury returned a verdict that the deceased had died from an overdose of cough mixture containing morphia inadvertently administered.

Prosecutions under the 17th Section of the Pharmacy Act.

At Mansfield Petty Sessions, last week, before Mr. Oakes, Captain Need, R.N., and Captain Salmond, John Davidson, grocer, Kirkby-in-Ashfield, was summoned for selling a packet containing poison, to wit, strychnine, in the form of vermin-killer, without registering the transaction, on the 6th ult.

Police constable Cuckson said on the day in question he called at defendant's shop in plain clothes and bought the packet of vermin-killer produced from defendant's wife, who asked no question whatever.

Police constable Blackburn said he took the packet to Mr. Cutts, Mansfield, for analysis.

Mr. Cutts, Mansfield, said he had examined the contents of the packet, and it contained strychnine.

Defendant pleaded ignorance.

Fined £2, Captain Need saying that it was a very dangerous practice, which must be stopped.

Ann Wharmby, shopkeeper, Kirkby, was similarly charged. She failed to appear. She had been previously cautioned.

Mr. Cutts, in speaking to the analysis of the contents of this packet, said it was a 6*d.* one, and he calculated that there was sufficient strychnine in it to poison fifty people.

Fined £2.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

The Draft Pharmacy Acts Amendment Bill.

Sir,—The nature and amount of correspondence which appears in the Journal of the 3rd inst. is alone a sufficient index of the very widespread interest which has been awakened by the publication of the Pharmacy Acts Amendment Bill, and it will probably assure the Council—if such assurance were needed—that whatever may be the ultimate fate of this Bill, to the production of which so much time and ability have been given, it will scarcely be opposed by that weight of apathy, or absolute indifference, which has been the chief factor of opposition to all similar efforts in former years.

In all parts of the country the want of legislation in some shape or form, connected with things pharmaceutical, has long been plainly manifest, and, in many cases, the more remote the district from London, the more urgent the necessity. Points of divergence in opinion have latterly occurred only in the expression of ideas as to the exact nature of the change desirable, and whilst most of us are agreed upon broad principles, it can scarcely be expected that the present Bill will exactly adapt itself to the want and wish of every individual. However, it seems already to be very generally regarded as a reasonable demand for that which undoubtedly the interest of the public requires at the hand of pharmacy; and if, with this, is preferred a moderate request for certain clauses which may react to the benefit of her devotees, it must be extremely necessary that our desires for the latter may not be accompanied by too much commotion about the former, or both will surely suffer.

As in the Council itself, so amongst your correspondents, clause 2 aroused the greatest amount of controversy, and that part of your leading article which refers to this subject is of particular interest. Upon reading the clause in question, and its discussion by the Council, it appeared to me that so far from being a departure from any of the recognized principles of the Society, it rather tended towards an extension of power. And were it not for your history of its origin, it would be hard to realize that such a demand could by any possibility be accorded. If the Society acquires the right to go outside its own community and insist upon certain restrictions in the sale of dangerous articles which it may from time to time schedule, a vast accession of influence must result, and such increase cannot be reflected, to the detriment of individual members. Hitherto the complaint has been, that the Council of the Pharmaceutical Society was not sufficiently active in comprehending the extent to which general traders encroached upon the border land of pharmacy; it is now asserting its right to interfere with the manner of conducting business in these self-same establishments, and thus claiming universal recognition as the guardian of public safety.

I have always held that two degrees of qualification, the higher being purely optional, constitute a source of weak-

ness; our spheres of labour are, to a certain extent, far too contracted to admit of such distinction, and it would be better for the public, the Society, and ourselves if in this respect at least we were upon terms of equality.

The matters connected with the educational clauses have been thoroughly discussed by the Council, and particularly agreed upon by the trade at large before their appearance in the Bill. Clause No. 13, to which Mr. Burrell takes exception, has for its object the protection of the pharmacists of the future. Many young men have entered upon their apprenticeship with very ill-defined notions of what is expected of them in the matter of preliminary education, or even of the examinations which await them at the expiration of their pupilage, whilst parents or guardians have totally ignored their responsibility upon this point. That the result has been deplorable the periodical pass list affords almost certain proof.

Every pharmacist, who is actually engaged in business, hears from time to time expressions of opinion upon the part of the outside public as to his position in comparison with other members of the trading community; almost every one of the educated public admits readily, with but little argument, that the pharmacist has rights for consideration and emolument which no other individual who keeps an open shop can urge. I cannot hesitate in believing that members of Parliament, differing in no great degree from the general public, would willingly admit such rights to a lawful recognition if only they were properly represented to them. In order to ensure an efficient representation I would suggest that a copy of the Bill should be sent by every Local Secretary, or other person appointed or approved by the Society, to all the members of Parliament in their district, together with a personal request for its consideration and support when the proper time came. By this means it would be possible to reach every member of Parliament from the most accessible quarter and perhaps do much to secure an easy passage for the Bill.

Meanwhile, every pharmacist can do much to this end, by lending hearty support and losing no opportunity of giving a *résumé* of the proposition to all those of influence who are willing to listen.

Kilburn, N.W. CHARLES B. ALLEN.

Sir,—The draft Pharmacy Bill, which has so anxiously been waited for, and which for such a length of time has engaged the attention of the Pharmaccutical Council, is at length in the hands of those who cannot but be deeply interested in its provisions. To those amongst us who have been cherishing utopian ideas of legislative enactments which should secure to the chemist a monopoly of the sale of all poisonous substances, to say nothing of an exclusive right in the retailing of drugs and pharmacopœial preparations, the Pharmacy Acts Amendment Bill will doubtless be a sore disappointment. The general favour, however, with which the Bill seems to be regarded, judging from the correspondence which has appeared in the Journal, must be a source of gratification to its promoters. That it should be perfection in all its details is more than would be reasonably expected. A generous expression of opinion with regard to the Bill by the members of the trade generally will, doubtless, be the means of removing anything which is objectionable in its provisions.

Mr. Sandford has done good service by pointing out the injustice and unnecessary hardship which will be inflicted upon the retailer of an insufficiently labelled patent medicine by clause 4, and I think his suggestion that the first action should lie against the proprietor of the medicine is an exceedingly wise one. With regard to the labelling of patent medicines containing poisons, I think both the inner and outer label should bear the word "poison."

The regulation concerning branch businesses will remove one of the most glaring inconsistencies of the existing law, and will operate beneficially alike in the interest of the pharmacist and in the protection of the public.

The distinction between pharmaceutical chemist and chemist and druggist is one which is not well understood by the public, and under the special circumstances of the case I do not see how any one can seriously object to that distinction being removed.

Considering the difficulties which surround the subject of pharmaceutical legislation I think the Council are to be congratulated upon the result of their labours, and I sincerely hope that their exertions many meet with that success which all who are interested in the progress of pharmacy must desire.

72, Lancashire Hill, Stockport. THOMAS HART.

Sir,—Although I have nothing much to add to what has already been said concerning the proposed "new Pharmacy Bill," it may, perhaps, be desirable that the views of those engaged in business in various parts should be made known.

In the Journal of the 3rd inst., Mr. Wade compares the result of the deliberations of the Society to the oft repeated quotation, "The mountain in labour after much commotion brought forth a mouse."

Certainly, the proposed Bill at first sight appears a simple measure, but inasmuch as it deals with most of the difficulties which have filled chemists' minds during late years, therein lies its merit.

It is clear that chemists now in business cannot expect much if any individual benefit from the Bill; but I cannot find any fault on that account, for the sooner we make up our minds to the fact that we must depend entirely upon our own individual energy for success, both monetary and social, the better for the business and all connected with it.

If we expect that the Pharmaceutical Society or the Government will make laws which will, in any sense, create a monopoly, or limit the number which enter our ranks, we shall expect that which, under the existing order of events, is impossible, for neither the Pharmaceutical Society nor the Government can improve our social position or our incomes by making laws. On the other hand, it must be evident that had not the Pharmaceutical Society always shown itself ready to take the initiative in regulating the sale of poisons, laws would have been passed by bodies outside our ranks to accomplish the same purpose, and taking into consideration the peculiar nature of our calling, harassing laws they would have been. Hence I maintain that we have much to thank the Councils (both past and present) of our Society for in so carefully looking to our interests. We are apt to overlook the fact that the Council is a representative body of ourselves. If the Council is not composed of such men as are best able to look after our interests, then we have ourselves to blame; in fact, in attempting to fling mud at the Pharmaceutical Council most of it must come back upon ourselves. I make these remarks knowing how deeply rooted among some in our ranks is the idea that the Council, in not providing us all with profitable businesses, has neglected its duty.

And now a few remarks concerning the Bill itself. With regard to clause 2, I cannot help recognizing that there are many articles requiring to be labelled "poisonous," which belong more properly to the business of the oil and colourman, and the sale of which cannot well be confined to chemists, without imposing a hardship upon the former tradesman. Moreover, dealing in such articles does not well assort with the chemist's business, now that the oil and colourman's business has become separated in towns of any size. On the other hand those chemists whose businesses partake of the nature of the oil and colourman's will not be at all injured by the clause.

I think that clause 4 will be found to require modification before the Bill is finally accepted. The large vested interests it will affect are well known, and the clause will undoubtedly meet with great opposition, unless care is taken to make it applicable only to those patents which strictly require to be labelled "poisonous." Undoubtedly it is a great anomaly that at present patent poisons can be sold without any restrictions; on the other hand, many patents, although they contain poison, contain it in such small quantities as to be harmless.

My own cough lozenges contain a poison. On one occasion a customer ate a whole box-full at one sitting, but suffered no greater harm than an attack of sickness. He might, indeed, have increased the dose without more injury. There are probably many patents similarly constituted, and it would be objectionable to label them "poison," as to do so would either unnecessarily injure their sale, or educate the public to regard the word "poison" as of little importance. I would suggest that all patents containing poison should be registered by the Pharmaceutical

Council, and the nature and proportion of the poison being known the Council shall decide upon the necessity for labelling them as poisons.

I would endorse the remarks made by Mr. Proctor on clause 4, and the remarks made by Mr. Sandford upon clauses 3, 4, and 8.

Undoubtedly clause 6 will press heavily on many unqualified managers, but to produce a Bill which would be hard on no one is a practical impossibility, and to as far as possible expunge all inconsistencies from the pharmacy laws will be a great point gained.

Mr. Burrell anticipates that inconvenience will be caused by clause 3. I do not myself think that a chemist, as the law now stands, can honourably have an apprentice bound before he passes his Preliminary, as there must be a great chance of his not passing it at all, and consequently he would waste his time during his apprenticeship, in learning a trade which he would not be able to follow up afterwards. I make it an absolute rule not to accept an apprentice until he has passed his Preliminary, and I find no inconvenience in carrying out that rule.

I am aware that the members of the Council have probably, in framing the proposed new Bill, been guided by considerations which, were they known to me, might change my views upon some of the above points.

Colchester. J. C. SHENSTONE.

Sir,—I am sure that all who have the true interests of the body at heart will be rejoiced to see the steps the Council has taken, both in adopting the recommendations of the Educational Committee and with regard to the amended Pharmacy Bill.

There can be no doubt that both these will tend to considerably elevate the position of pharmacy in this country.

But I certainly think, if it is thought advisable to admit the "Minor" men as members of the Society, that a fellowship should be formed by the Council for those who have taken the Major qualification. If this is done I am quite sure there will be a great increase of candidates for the Major examination.

I do hope the Council will not let this matter pass, but carefully consider it for the interests of pharmacists.

Bentley Road, Princes Park, Liverpool. C. J. S. THOMPSON.

Sir,—The admission of my letter, representing, perhaps, the extreme of opposition, must convince members of your impartiality and desire to have all opinions represented. I should not have trespassed on your indulgence again had you not in your last leader on the Pharmacy Act, by some mistake, misinterpreted one portion of my letter, and made me express the very opposite opinion to that I put forth on the clause relating to branch shops.

I have no objection whatever to clause 8. I contended that if co-operative stores and corporate bodies could become proprietors, having qualified chemists to conduct their business, that orthodox chemists should enjoy the same privilege upon condition that their managers were qualified men.

I fail to perceive any clause in the Bill which will prevent corporate bodies dispensing and retailing poisons—and if there were, I should consider the passing of it through the Legislature highly improbable after the decision of the highest Court of Appeal in their favour. At present, I appear to be the only "adverse critic." Although holding so unenviable a position, I must, in justice to myself, ask you to allow me to say that I am hopeful that the weak "vinegar" I have been able to distil out of the Bill may be beneficial in cooling the imagination of those pharmacists who seem to indulge too hopefully in the remedial effects of the pharmaceutical wine.

174, *Warwick Street, Pimlico, S.W.* JOHN WADE.

THE COMPOSITION OF CACAO BUTTER.

Sir,—In "The Month" article published in your issue of February 24, attention is called to some experiments of Herr Traub, from which I gather that he has been unable to confirm the existence of my theobromic acid, $C_{64}H_{12}O_{28}$ and did not suceed in obtaining a higher fatty acid than arachic acid, $C_{20}H_{40}O_2$.

I have not been able to consult the original paper by Herr Traub, but as I did obtain an acid of the composition here given, and have a quantity still in my possession, I can only conclude that his investigation was not conducted with the same patience and pains with which I worked, and that he too soon grew tired of fractionations, which, if steadily pursued, would, in all probability, have resulted in obtaining the acid.

As I wish to stand well with your readers, I will add that I entirely adhere to the results of my original investigation (*Journ. Chem. Soc.*, January, 1878) and have no doubt that Herr Traub's arachic acid was a mixture of lower and higher fatty acids. I obtained such a mixture as an intermediate product, and if he had gone on fractionating this, his highest product, again and again, he would have been better advised than in committing himself to a gratuitous assumption and a pointless criticism.

	Kingzett's Theobromic Acid.		Kingzett's Intermediate product.	Composition of Arachic Acid.
	Theory.	Obtained.		
C.	82·75	82·62	76·81	76·92
H.	13·79	13·92	13·14	12·82
O.	3·46	3·46	10·05	10·24

There could be no confusion of such widely differing substances as are here indicated.

Further, in spite of Herr Traub's statement to the contrary, no proof has yet been afforded that either palmitic acid or stearic acid is obtainable from cacao butter.

In conclusion, should any reader of this protest wish to investigate the matter, I will gladly place in his hands such products as I have preserved, for analysis, and I extend the offer to Herr Traub.

C. T. KINGZETT, F.I.C., F.C.S.

SPIRITUS AMMONIÆ AROMATICUS.

Sir,—I should like to point out a slight inaccuracy into which Dr. Thresh has fallen, in his paper on the above subject, published in the Journal of February 17. He says, "Taking the official quantities, the ammoniæ carbonas refuses to dissolve in the requisite amount of water and solution of ammonia without the aid of heat." The "requisite" amount of water I take to be about 10 ozs., and I find that using this quantity complete solution takes place at ordinary temperature in about one hour, provided that the ammon. carb. be powdered and the mixture be continuously agitated. Mr. Martindale attempted to demonstrate this, but failed in not carrying out the conditions as to the "requisite" quantity of water, as pointed out by Dr. Thresh in the ensuing number of the Journal.

Tottenham High Cross. A. E. TANNER.

E. Fowler.—(1) Probably a bark derived from some species of *Quercus*. (?) Probably the bark of *Acacia melanoxylon* or *A. molissima*.

J. T. Hall.—(1) *Schistidium apocarpum*; (2) *Anomodon viticulosus*; (3) *Radula complanata*; (4) *Erodium cicutarium*.

J. F. Brown.—*Ptychotis Ajowan* seeds; cardamon seeds; coriander seeds, decorticated; and (?) cocoa nut.

Herbalist.—(1) *Mercurialis perennis*; (2) *Chelidonium majus*; (3) *Sedum reflexum*; (4) *Potentilla Fragariastrum*; (5) *Cotyledon Umbilicus*; (6) *Triticum repens*.

Alpha.—For recipe for "bay rum," see before, p. 39.

Novice is referred to the rule as to annonymous communications.

Felix.—At present it is not illegal for an unregistered person to make up such recipes unless they contain a scheduled poison. The subject of prescribing does not come within the scope of the Bill.

M. A.—Cooley's 'Cyclopædia' or Besley's 'Receipt Book.' See also the indexes of the *Pharmaceutical Journal*.

G. A. T.—The ingredients appear all to belong to the class of specialties with which the United States is flooded.

D. R. Howell.—Yes.

C. E. Dungate.—Your letter, with enclosure, has been handed to the Secretary.

Nemo.—The legality of the use of any one of the designations would depend much upon the object for which it was used. See section 40 of the Medical Act, 1858.

COMMUNICATIONS, LETTERS, etc., have been received from Messrs. Evans, Hay, Heger, Cutts, Bowness, Nandin, Wood, Cernum, Major, Gulielmus, Assistant, A. J. W., T. D., M. A.

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See PHARM. JOURN., *March* 10, 1883.

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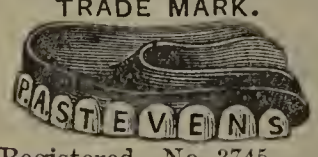

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See Chemist and Druggist, January last, page 33.

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Who offer the finest pale steam refined COD LIVER OIL, in original 25 gallon tin-lined casks, and can now supply Rectified Spirits of Wine in quantities of two gallons and upwards.

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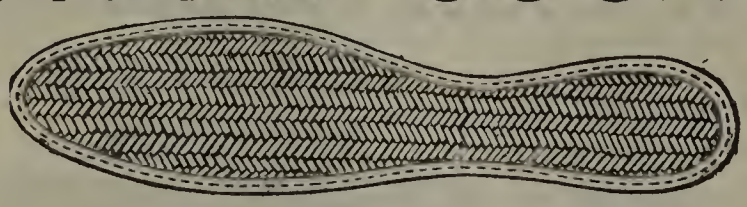

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BROKEN-LEAF TEA, 1s. 8d. per lb.

A MONEY SAVING TEA. ABSOLUTELY PURE.

The small leaf from some of the finest India and China Teas. Produces a tea in the cup stronger, richer, and cheaper than most whole-leaf teas. Agents appointed, where unrepresented, throughout the United Kingdom.

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BEST at the PRICE EVER SOLD. Great strength, and a most useful tea where there is a large consumption. Recommended to all who wish to SAVE in their tea. Agents appointed, where unrepresented, throughout the United Kingdom.

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AGENTS APPOINTED, where unrepresented, throughout the United Kingdom.

Prospectus and samples free on application.

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MR. CUPISS, Diss, Norfolk, proprietor of the Constitution Balls, will have pleasure in supplying the trade, on application, with Bills for distribution, and Posters, which are very attractive, delivered free to any House in London, or other large town, for enclosure; and to prevent error, it is desirable to send a card of address.

NEW AIR PURIFIERS.—RIMMEL'S AROMATIC OZONIZER, a fragrant powder emitting the cool and healthy breezes of the Pine and Eucalyptus, 1s., by post fifteen stamps. Ozonized Eau de Cologne, Lavender or Florida Water, 2s. 6d. Aromatic Pocket Cassolette, to preserve from infections, 6d., by post seven stamps.

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STUDENTS' AIDS TO EXAMINATION.

PRELIMINARY.—Arithmetic and Metric System, 1s. How to Write an Essay, 6d. Latin Grammar and Cæsar Simplified, 1s. MINOR.—Equations Simplified, 1s. Illegible Autograph Prescriptions, 1s. Minor Questions, gratis. Notes on Dispensing, 1s. Prescriptions given at the Minor, 1s. For "How to Prepare for either Exam.," enclose stamped envelope, CHEMIST, care of Mr. J. Edwards, Wye, Kent. Herbarium of Plants, 6s.

PHARMACEUTICAL PRELIMINARY,

LONDON Matriculation, College of Preceptors, Apothecaries' Hall, Glasgow, Edinburgh, and all Medical Preliminaries. Rapid and thorough preparation, privately and in class. Also postal tuition for these examinations and Bell Scholarship. For particulars enclose stamp, Mr. DAWES, 1st B.A. (Lond.), 11, Burton Crescent, London, W.C.

Advertisements for the next issue must be sent on Tuesday. See notice on page iii.

THE

CENTRAL SCHOOL OF CHEMISTRY & PHARMACY

Laboratory and School Buildings:

173, MARYLEBONE ROAD, N.W.

At the Examinations held in London last month, the following Students of this School were successful.

MAJOR.

Mr. BALL. Mr. DANGERFIELD.

Only the above *two* presented themselves, and *both* were successful.

MINOR.

Mr. DAVIES. Mr. ROBINSON.
„ FOSTER. „ RYE.
Mr. THOMAS.

At Edinburgh, in January, Mr. GILBERT, a Student of this School, was successful in passing the *Major* Examination.

For Prospectus apply to Messrs. LUFF & WOODLAND.

PRIVATE TUTOR

Mr. JAS. W. SAUNDERS
(*From the Royal School of Mines*),
130, CAMDEN ROAD, N.W.

EIGHT of my Students presented themselves at the February Minor. **FIVE** passed. **PERSONAL TEACHING. NO DEMONSTRATORS.** Postal Instruction if required. Enclose stamp for particulars and terms; or "at home" daily from 1.30 to 2.30.

Laboratory close to Gower Street Station.

"SYSTEMA OMNIA VINCIT."

SOUTH LONDON SCHOOL of PHARMACY

325, KENNINGTON ROAD, S.E.

Director: Dr. JOHN MUTER, M.A., F.I.C., F.C.S., &c.

FOURTEENTH SESSION, 1882-3.

Every bench in the Pharmaceutical Laboratories is engaged up to the April Examinations, and more than half until July. For the remaining places, Syllabus, &c., apply to W. BAXTER, Secretary.

MINOR & PRELIMINARY.

TULLY'S Postal System is the most successful method of preparing without leaving business. Fee—MINOR, One Guinea. PRELIMINARY, 10s. 6d. Send for particulars and *original Testimonials* (*not Copies*) to Mr. J. TULLY (Hills Prizeman), Chemist, Tunbridge Wells. Established 1872.

WESTMINSTER COLLEGE OF Chemistry & Pharmacy.

The COURSE of LECTURES and CLASSES for the June and July Examinations will be commenced on FRIDAY, APRIL 27th.

In order to secure the comfort of Students during their stay in College, Mr. Wills (Principal) has made arrangements to provide a limited number of Students with Board and Lodging at his Private Residence, Gladstone House, St. George's Road, Southwark.

Terms, Four Guineas per Month.

FEES from April 27th.

(*Inclusive of Lectures, Classes, and Laboratory Instruction.*)

MAJOR or MINOR.

To the June Examination	**£5 5s.**
To the July „	**£7 7s.**
Until Qualified	**£10 10s.**
Major and Minor, Until Qualified	**£15 15s.**

Any gentleman desirous of attending a Lecture can do so on presenting his business card at the office.

At the last Examinations the following Students of the Westminster College were successful in passing.

MAJORS.

* Mr. W. T. DEEKS.
* „ J. B. FOGGITT.
* „ F. H. PROSSER.
* „ J. WILSON.

MINORS.

Mr. J. A. C. BOYDEN.
„ E. J. CAFFYN.
„ F. CLARK.
„ R. GILL.
„ S. HARRIS.
„ W. HUDSON.
„ J. J. JARY.
„ J. LAVERTY.
„ H. H. MASON.
„ A. B. PASSMORE.
„ T. C. STACEY.
„ A. TURNER.

*** All the above Major Students passed at their first attempt.**

For Prospectus and other information, apply to

Messrs. WILLS & WOOTTON,
TRINITY SQUARE, LONDON, S.E.

TERMS FOR ADVERTISEMENTS

IN THE

PHARMACEUTICAL JOURNAL.

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Advertisers are requested to observe :—

1.—That Advertisements are received at the Publishing Office (as below) not later than ten o'clock on Thursday morning, and they must be prepaid.

(*In consequence of Good Friday occurring in the ensuing week, Advertisements for the 24th inst. must reach the Office on Wednesday Morning, 21st inst.*)

2.—That letters addressed to initials or to fictitious names at a Post Office are not taken in, but are at once sent back to the writers by the Post Office Authorities.

3.—That all letters respecting the insertion of Advertisements should be endorsed on the envelopes "**PHARM JOURN,**" and must be sent only to the Publishers.

Estimates for Advertisements, in Wide or Narrow Measure, for Single insertion or for Series, will be sent on application to the Publishers.

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Students can enter at any time.

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MAJOR	... ...	One Guinea.
MINOR	... ...	One Guinea.
PRELIMINARY	... ...	Half-a-Guinea.

Students who desire to commence to read up for their Examinations, but who are unable at present to leave their business engagements, are advised at once to enter under

Wills' Universal Postal System

when they cannot fail to make rapid progress.

Under this system one or more Lectures are forwarded weekly, to be mastered by the Student, and examination papers are sent monthly to test his progress.

Salts for analysis, autograph prescriptions, and botanical plates, &c., are also sent to each Student.

Syllabus, opinions of the press, and testimonials sent on application to Messrs. WILLS & WOOTTON, Trinity Square, London, S.E.

PRELIMINARY.—The Head Master of the Grammar School, Hingham, Norfolk (who has passed 80 per cent. of the Candidates he has prepared for this Examination), wishes to meet with two or three pupils to read for the July Exam. Pass List and Terms an application.

ENGAGEMENTS WANTED.

Advertisements for the next issue must be sent on Tuesday. See notice on page iii.

A GERMAN (Saxony), highly recommended, age 25, height 5ft. 10in., speaks French and English, can aid in a Surgery, seeks place as ASSISTANT, for April 1st. Full particulars, care of Mr. Poths, Sugarloaf Ct., Leadenhall St., or C. REHM, English Chemist, Lausanne.

AS JUNIOR. Age 20. 5 years' experience. Height 5ft. 6in. Disengaged April 9th. Good reference. BANDFIELD WHITE, 18, Fore St., Taunton.

AS SENIOR, or to MANAGE a Branch. 11 years' first-class experience. Major qualification. Age 26. Good references. PHARMACIST, care of Mr. Chorley, 29, Silver St., Taunton.

AS DISPENSER. Major and Hall qualifications. Age 23. C. G. C., with H. L. & Co., 107, Grafton St., Dublin.

MANAGER. Registered. Age 44. Married. 26 years' experience in country businesses, last 19 at Bury St. Edmunds. Unexceptionable references. G. J. B., 25, Well St., Bury St. Edmunds.

AS JUNIOR or IMPROVER in the Retail and Dispensing business. Age 21. G. H., Mrs. Jones, 3, Middle Gardens, Clemson St., Willenhall, Staffs.

AS JUNIOR in a good Dispensing establishment. 3½ years' London experience. Passed Prelim. Good reference. Time for study required. A. L., Shiplett, Bleadon, Weston-super-Mare.

LOCUM TENENS.—Mr. W. B. WEST, Staines Rd., Hounslow. 30 years' town and country experience, and unexceptionable references as Temporary Manager extending over the last 12 years.

AS ASSISTANT. In or near London. With three hours daily for study. Age 25. Satisfactory references. Qualified. Please state business hours, time allowed, and salary given. ALPHA, 1, Brighton Rd., The Avenue, Southampton.

AS JUNIOR or IMPROVER. For first week in April. Nearly 4 years' experience. First-class references. Age 19½. Height 5ft. 8½in. W. E. BROWNE, 6, St. James' Parade, Bath.

AS TEMPORARY, for week, fortnight, or month. Well up in all branches. Good references. Disengaged. Age 25. E., 61, Parkholme Rd., Dalston Lane, Dalston Junction,

LOCUM TENENS, TEMPORARY, or otherwise. Minor qualification. Quick and accurate Dispenser. Good Accountant. Thoroughly understands Postal duties. B., 56, Cazenove Rd., Stamford Hill, N.

AS ASSISTANT in the Retail. Age 31. Has had first-class experience in town and country. A. B. C., 15, Corn Sq., Leominster.

DISENGAGED.—As ASSISTANT or MANAGER. Ætat. 24. Height 5ft. 9in. Minor and Hall. London experience. Can Prescribe. Out-door preferred. Town. A. P. S., 9, Pier Ter., South Shields.

AS JUNIOR. Age 20 in June. 5 years' experience. Good references. State salary, &c., to H. S. SMITH, Mr. Tomky's, Chemist, Brownhills, near Walsall.

BY advertiser. Age 27. In good country business, with view to succession. Minor qualification. Unmarried. F. PHIPPS, 19, Kingsmead Sq., Bath.

ENGAGEMENTS WANTED.

TO Pharmaceutical Chemists. A Junior Assistant (in-door) wishes for an engagement in London, South Coast or Isle of Wight. Has more than 3 years experience of Compounding and first-class Retail trade, is well educated and gentlemanly, can produce the highest of references and testimonials as to ability, and would accept a very small salary. Please state business hours. Theo', 21, Tipping St., Stafford.

MANAGER of Branch or Dispenser. Married. Middle-aged. 25 years' experience, town and country. Registered Chemist. Good references. Disengaged. In or out-door. W. Hudson, The Willows, Figgs Marsh, Upper Mitcham.

MANAGER of Branch or Locum Tenens. Immediately. 13 years' reference as Manager. Permanency desired. Prescribing business preferred. Age 38. Married; no family. J. T., 62, Westbourne Rd., Barnsbury.

AS Assistant. With morning free to attend lectures. In London. Minor and Hall qualifications. Satisfactory references. Age 22. H. A. W., 110, Newington Causeway, S.E.

MANAGER or Senior. Married. Age 30. Minor qualification. Registered Dentist. Town and country experience. A permanency required. K., 5, West Pl., Fareham.

AS Assistant. In a good Dispensing business. First-class reference and experience. Age 26. Height 5ft. 10in. Disengaged on the 27th. R. M., 35, South Molton St., Bond St., W.

ASSISTANT, Manager or Temporary, or Dispenser to Surgeon. Good counterman. Thorough experience. Now disengaged. 3 years' good reference. Omega, 227, Mayall Rd., Herne Hill, S.E.

DISENGAGED April 13th.—As Junior. With time to study for Minor. London preferred. Age nearly 21. Height 5ft. 8in. Over 4 years' first-class experience. Chemicus, 8, Orwell Pl., Ipswich.

AS Dispenser or Chemist's Improver. Nominal salary or first 3 months free. Age 25. Sober and steady. Good references. Walker, 5 Calthorpe St., Gray's Inn Rd., W.C.

WHOLESALE.—Assistant. Age 28. Varied experience. 5 years Corbyn & Co. Good references. T. J. Downes, 44, Cumming St., Pentonville, N.

EARLY in April.—By a German. Age 24. Speaks English. Good references. Small salary. C. B., care of Mr. Buchner, 124, High St., Whitechapel, London, E.

AS Manager or Assistant in the Retail. In a good country or county town. One with the opportunity to purchase preferred. Minor qualification. Excellent references. Please state particulars. Chemist, 1, Brighton Rd., The Avenue, Southampton.

LOCUM Tenens.—A gentlemanly business man, of good address and long experience (Pharm. Chemist), seeks an engagement for a long or short period. Medicus, 2, Chichester St., W.

AS Manager or Senior. With a view to purchase. Thoroughly experienced. Unexceptional references. J. E. D., 4, Upwood Ter., Burnt Ash, Lee, S.E.

ASSISTANTS WANTED.

Advertisements for the next issue must be sent on Tuesday. See notice on page iii.

AN able Assistant, for one of our firms in the East. Apply by letter to A. S. Watson & Co., 106, Fenchurch St., E.C.

ASSISTANTS WANTED.

IMMEDIATELY.—An Assistant, about 22 years of age, who has been accustomed to a good class Dispensing business. State full particulars of experience, age, height, salary required, enclosing carte, to W. H. Gibson, 107, King's Rd., Brighton.

A COMPETENT Junior Assistant. In-doors. For country trade. One whose character will bear strict investigation. Hours, 8 to 7. W. Agar, Chemist, Mansfield.

INTELLIGENT youth as an in-door Apprentice to a Chemist and Mineral Water Manufacturer. Country. Help would be given him in studies by a Silver Medallist (pharmaceutical). Premium £70. Chemist, Albert Bldgs., Queen Victoria St., E.C.

A JUNIOR Assistant. Out-door. Of gentlemanly appearance and address. Must be a good Dispenser, and well up in the business. Apply, with full particulars, enclosing carte (to be returned), to J. J. Leigh, Chemist, Bishop Auckland.

A GENTLEMANLY and experienced Assistant, in a good class trade. One who has a knowledge of Homœopathic Pharmacy preferred. No Sunday duty. Apply, stating age, experience and salary required, to W. Butcher, Chemist, Blackheath, S.E.

MESSRS. COOPER & CO., 80, Gloucester Rd., South Kensington, S.W., require an Assistant, about 22 or 23 years of age, to put up stock and assist in Dispensing. Apply personally, if possible; if by post, state age height, salary expected, enclosing carte, which will be returned.

AN Assistant, steady and obliging, for general business. West of England. Out-doors. Satisfactory reference required. State salary. Apply, Hamilton James, Chemist and Druggist, Truro.

FREDERICK GIBSON, Gooch St., Birmingham, has a vacancy for an energetic Assistant, in a light but quick Retail business, who can be well recommended by former employers. Time to attend Stokes Dewson's Classes will be allowed. Two apprentices and porter kept. State experience, salary required, and all particulars.

IMMEDIATELY.—Age from 25 to 30. Thoroughly accustomed to a general Retail and Prescribing business. Must be able to Extract Teeth, and take occasional Management. Full particulars, T. C. Holford, L.D.S., 342 and 344, High St., Stratford, E.

ABOUT the middle of April.—A competent and trustworthy Assistant. Minor qualification preferred. From 21 to 24 years of age. For a respectable country business. Unexceptionable references indispensable. Address, with full particulars, and carte if practicable (to be returned), Pharmacist, care of Messrs. W. Edwards & Son, 157, Queen Victoria St., E.C. Letters unanswered within 7 days declined.

IMMEDIATELY.—Steady married man to Manage a Branch in the suburbs of Manchester, doing a middle-class trade. House and gas free. State age, salary, &c. expected, and references from last two situations. Address, in the first instance, A., Messrs. Woolley, Sons & Co., Market St., Manchester.

A COMPETENT Assistant for a Dispensing and light Retail business. Must be well recommended. A Junior of good experience will be treated with. Apply, with full particulars and carte, to W. H. Davison, High St., Hastings.

AT once.—A gentlemanly Assistant, accustomed to good class business. Not under 23. For the Retail counter. Also, by the middle of April, a Junior, not under 21. Apply, stating age, height, experience and salary, and enclosing carte, to Payne & Adams, Shrewsbury.

ASSISTANTS WANTED.

Advertisements for the next issue must be sent on Tuesday. See notice on page iii.

LABORATORY.—A man, holding Minor qualification and acquainted with Laboratory work, not under 24, for South Africa. Apply by letter to B. G. LENNON & Co., 11, Edmund Pl., Aldersgate St., London. Applications not answered in a week may be considered declined.

FOR the 28th inst.—An ASSISTANT, not less than 23. With Minor qualification preferred. Must be good Dispenser and Counterman. Two employed. Apply (if by letter, with carte, to be returned), stating age, height, references, when disengaged, and salary required, to ROBERT BIRD, Pharmaceutical Chemist, 103, High Holborn, W.C.

AT once.—A thoroughly competent ASSISTANT. Age 26 to 30. Preference given to one seeking a permanency, and who is a Registered Dentist. Apply, Mr. JONES, Chemist, Dalston Lane, Dalston Junction, N.

IMMEDIATELY.—A gentlemanly ASSISTANT. Age about 23. Qualified by examination, and accustomed to the routine of a first-class business. Three assistants kept. Address, enclosing carte (to be returned), and giving age, height, salary required, and references, to E. H. METCALFE, Pharmaceutical Chemist, Malvern.

AT once.—A Junior ASSISTANT or IMPROVER. Indoors. Age about 21. For the Mixed trade. Apply, stating salary required and usual particulars (enclosing photo.), to P. SMITH & Co., Runcorn.

AN APPRENTICE, who has passed the Preliminary or its equivalent. In a first-class Dispensing and Family business (old established) in the Western suburbs of London, where there are unusual opportunities of acquiring a superior knowledge of the business. Address, PHARMACIST, care of Messrs. A. S. Hill & Sons, 101 and 103, Southwark St., S.E.

IMMEDIATELY.—Lancashire.—A JUNIOR or IMPROVER, in a light Retail business. No Sunday duty. Comfortable home. Time for study in lieu of salary. Apply, A. D. B., Hearon, Squire & Francis, 5, Coleman St., London.

JUNIOR ASSISTANT, about 21 years of age, in-doors, for a Retail and Dispensing business. One of steady habits, good experience, and that has passed Preliminary. Good references required. Apply to W. C. FRY, Chemist, 18, Fore St., Taunton, Somerset.

A JUNIOR ASSISTANT for a Dispensing and light Retail business. Churchman preferred. Apply, stating age, height, salary required, reference, when disengaged, &c., to F. SUSSUM, 6, Market Pl., Cambridge. Photo. to be enclosed if possible.

A COMPETENT ASSISTANT for a large Dispensing business in the West-end. Apply, stating age, height, and references, to N. M., care of the Secretary, 17, Bloomsbury Sq., W.

JUNIOR or IMPROVER for light Retail and Dispensing. Senior assistant kept. Must have unexceptional references. Apply, stating terms, &c., to W. D. GIBB, Chemist, 31, Piazza, Winchester.

WALTER GREGORY, Wellington, Somerset, requires an ASSISTANT, about 22 years of age, of active and obliging habits, for a good class Mixed country trade. Minor qualification preferred. Please send usual particulars, with carte, to be returned.

A JUNIOR ASSISTANT or IMPROVER for Mixed business, Midland Counties. Apply, stating age, references, and salary required, FOWKE & SON, Chemists and Seedsmen, Market Sq., Stafford. Letters not answered in a week declined.

ASSISTANTS WANTED.

MESSRS. ARGLES & STONHAM, Maidstone, have a vacancy for a Junior ASSISTANT. In-door. Not under 21 years of age. Minor qualification desirable. Applicants are requested to state full particulars.

AT once.—A steady industrious JUNIOR. Accustomed to Mixed business. Credentials required. JOHN LITCHFIELD, Dispensing Chemist, High St., Longton, Staffordshire.

A THOROUGHLY competent Senior ASSISTANT. In-doors. Qualified preferred. Not under 25. Of gentlemanly appearance and good address, and capable of taking management during absence of principal. Must be a reliable Dispenser, and accustomed to first-class retail. Also a gentleman of good experience as Second ASSISTANT. Apply personally, or if by letter, enclose carte, with full particulars, and state salary required, to E. C. PERKS, 1, Sloane Sq., London.

AN ASSISTANT. Not above 30. Competent to Manage a medium-class business. Address, with particulars, references and salary expected, Mr. J. S. FLETCHER, 59, Breck Rd., Liverpool.

A COMPETENT ASSISTANT, of obliging manners and good address, for a good Retail and Dispensing business. Apply, stating age, height, and salary required (with carte, if possible), and references, to GEORGE BAXTER, Pharmacist, Chester.

WHOLESALE.—ASSISTANT, to take charge of Sundry Department. Apply, with testimonials, age and salary required, to Box 159, Post Office, Newcastle-on-Tyne.

IMMEDIATELY.—JUNIOR or IMPROVER. Active and obliging. For Mixed country trade. Hours 8 to 8 alternately with 8 to 9. Little Sunday duty. A Christian young man of any denomination. Dissenter preferred. Small salary first six months. Send full particulars in first letter, age, salary, height, and photo., with references, to WILLIAMS, Chymist, Coleford, Gloucestershire.

AFTER Easter.—An ASSISTANT. About 22. Accustomed to a good Retail and Dispensing business. Apply, stating height, salary required, and references, P. HALL, 118, Grey St., Newcastle-on-Tyne.

A SENIOR ASSISTANT, accustomed to good class of business. Must write a good hand. Apply, stating age, height and salary, also last situation, to Messrs. GIBBS & GURNELL, Ryde.

IMMEDIATELY.—An ASSISTANT, who has been accustomed to a first-class Family and Dispensing business. Must be of gentlemanly appearance and good address. State age, with every particular as regards references and salary required, to WILLIAM JERVIS, Broomhill, Sheffield.

OUT-DOOR.—A steady, energetic, obliging ASSISTANT for a Mixed business, small wholesale included. Would be required to give assistance in both, and make himself useful. Permanent situation for one able and willing to work. Send full particulars, references, and salary expected, by letter to ASSISTANT, Mr. Lightowler, Printer, Scale Lane, Hull.

AN IMPROVER or JUNIOR. One with good character, and accustomed to a good class country business. Enclose photo., with testimonials (which will be returned). Address, EDMUND JONES, Chemist, Hanley.

BATH.—Immediately.—An ASSISTANT, accustomed to good class Retail. Energetic, and a neat Dispenser. Qualification not essential if reference is satisfactory. Apply, EVANS, LESCHER & WEBB, Bartholomew Close, or to J. E. PINCH & Co., Bath.

JUNIOR CLERK, for the Wholesale. Apply, with full particulars, to B. B., 94, Shaftesbury Rd., Crouch Hill, N.

ASSISTANTS WANTED.

BY the end of March.—An Assistant. Out-door. Over 30. Qualified. Well up in Dispensing and West-end Retail. Of good address, references and experience. Competent to take charge in absence of proprietor. Apply to Mr. Harvey, Chemist, 45, Kensington High St., W. One from Co. Store not objected to.

A COMPETENT Senior Assistant. Accustomed to first-class country trade. Liberal and progressive salary for experience, good address, and thorough business habits. State age, height, salary required, and enclose carte. Chave & Jackson, Pharmaceutical Chemists, Hereford.

AN Assistant, who has passed the Minor. Aged about 24. Also an Assistant for Laboratory work. Apply at Messrs. Probyn & Co., 55, Grosvenor St.

A JUNIOR Assistant, about 21 years of age, who can be well recommended. Apply personally, or if by letter, state age, experience, and salary expected. W. M., 346, Essex Rd., London, N.

A COMPETENT Assistant. Must be a neat and accurate Dispenser, and well up in the Retail. Age 24 to 30. In-doors. State full particulars. W. Pinyon, Chemist, 49, Abbey Rd., St. John's Wood, N.W.

A QUALIFIED unmarried Assistant, not over 30 years of age. Competent to take entire charge of a branch. Must be a thorough good business man, with unexceptional references. Apply Goodman & Co., 4, Collyer Ter., Gipsy Rd., Lower Norwood, S.E.

BUSINESSES FOR DISPOSAL.

Advertisements for the next issue must be sent on Tuesday. See notice on page iii.

ANY gentleman wishing to succeed to a thoroughly good suburban Business in a few months can, by acting as Assistant, test the genuineness and worth of the concern now offered. Value £800, but arrangement could be made for part to remain. Address, with reference and experience, to E. M., care of Hearon, Squire & Francis, 5, Coleman St., E.C.

IMMEDIATELY.—In consequence of the death of the proprietor. A lucrative Drug Business, with Stationery attached. Situate in the central part of the market town of Ringwood, Hants. Further particulars to be obtained of the Trustee, Mr. Frampton, Grocer, Ringwood.

WANTED, with a view to succession, a Partner in an old established Business of Chemist and Druggist, Seedsman, &c., Wholesale and Retail Wine and Spirit Merchant. In a large town in an agricultural district of South Wales. Coming in about £1000. The business is capable of improvement in all its branches. For particulars apply by letter to J. H., care of Messrs. Hodgkinson, Prestons & King, 81, Bishopsgate St. Without, London. None but principals treated with.

SCARBRO'. — The Business of the late James Williamson, Pharmaceutical Chemist, South Cliff, Scarbro'. Dispensing and first class trade. Returns for last three years averaged £700 per year. Apply, J. T. Williamson, Chemist, Hunslet Rd., Leeds.

IN Chancery.—Chemist's and Druggist's Businesses.—Messrs. Hudson Smith, Williams & Co. are instructed to offer for sale by private treaty the Businesses lately carried on by Mr. John Facey, Chemist and Druggist, deceased, at White Ladies Rd., Clifton, and at Woodwell Crescent, Bristol. Tenders will be received by the Brokers at their offices, Exchange, Bristol, until Saturday, the 31st inst. Particulars and orders to view may be obtained from them or from Messrs. Benson & Carpenter, Solicitors, Corn St., Bristol.

Dated, Exchange, Bristol, 14th March, 1883.

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MESSRS. GURDEN BERDOE have for transfer:—N. Corner Retail, Dispensing and Prescribing Trade. Old established. Elegantly fitted. Well stocked. Showing £387 net profit. £875. N.W. Important thoroughfare. Returning now £18 weekly, under manager. Must increase. £800, or offer. Another. Showing £300 net profit. Only £450, or offer. W. Old established corner Prescribing and Retail. Very profitable. Returning £700. For £550. Excellent residence. Northampton. Unopposed Family and Agricultural Trade. Returning £800. Good house, garden, orchard, &c. Only £500. Gloucestershire. Unopposed. Returning £750. For £550. Essex. Unopposed. Returning £700. Open to offer. Dorset. Returning £1200. Well fitted and stocked. £1000, or offer. Part remain. Lancs. Retail and Agricultural. Returning £14 weekly. Rent £20. For £250. Apply, 30, Jewry St., Aldgate, City.

WEST End.—In the best part. A high class Business. Would suit a bachelor or one desiring to reside in the suburbs. Long and valuable lease. Handsomely fitted and well stocked shop, and large profits. No agents. Apply, Pharmacist, Cleaver, Buckwell & Co., 9, Gt. Castle St., Regent St., W.

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MR. HINE GILBERT is instructed to sell the oldest established Business in most rising Seaside Town, South of London. Price required £900. Also another. At favourite watering place. Returns £800. Price £500, or reasonable offer. Lancs. Returns £1150. Price £650. South Coast. Death vacancy. Returns £400. Incoming £50. Apply, 17, Hart St., Bloomsbury, W.C.

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£600.—A newly established Business. Handsomely fitted in mahogany by Treble. Corner premises. Commodious modern house. Valuable lease. Large and rapidly increasing London suburb. Address, Chemist, Messrs. Godson & Co., 54, Borough High St., London.

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PURSUANT to an Order of the High Court of Justice, Chancery Division, made in the matter of the Estate of THOMAS DEMPSTER MEIKLE, deceased, MEIKLE against MORRISON, 1883, M. No. 127. The Creditors of the above-named THOMAS DEMPSTER MEIKLE, late of Great Berkhampstead, in the County of Herts, Chemist, who died in or about the month of February, 1881, are, on or before the 10th day of April, 1883, to send by post, prepaid, to Mr. A. H. BRIGGS, of the firm of GREIG, MEIKLE & BRIGGS, of 5, Verulam Buildings, Gray's Inn, in the County of Middlesex, the Solicitors of the Defendants, THOMAS MARSHALL MORRISON, ELIZABETH MEIKLE and JANE AGNES WILSON AITCHESON, the Executors of the said deceased, their Christian and Surnames in full (including those of partners), their addresses and descriptions; the full particulars of their claims, a statement of their accounts and the nature of the securities (if any) held by them; or in default thereof they will be peremptorily excluded from the benefit of the said Order.

Every Creditor holding any security is to produce the same before the Vice-Chancellor BACON, at his Chambers, situated at the Royal Courts of Justice, Strand, Middlesex, on Wednesday, the 18th day of April, 1883, at 12 o'clock at noon, being the time appointed for adjudicating on the claims.

Dated this 9th day of March, 1883.

E. LIONEL CLARKE, Chief Clerk.

LOVELL, SON & PITFIELD, of No. 3, Gray's Inn Sq., in the County of Middlesex, Agents for BULLOCK & PENNY, of Great Berkhampstead, in the County of Herts, Solicitors for the Plaintiffs.

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Advertisements for the next issue must be sent on Tuesday. See notice on page iii.

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AN English Chemist and Druggist in Chicago, U.S., who can produce highest references, is desirous of obtaining an Agency for any Specialities, or to represent some good house. An interview can be arranged. Apply, ALPHA, 3, Dungannon Ter., North End Rd., Walham Green, London.

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Advertisements for the next issue must be sent on Tuesday. *See notice on page iii.*

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The Pharmaceutical Journal AND Transactions.

THIRD SERIES, No 665.] SATURDAY, MARCH 24, 1883. [PRICE FOURPENCE.

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Pharmaceutical Society of Great Britain,

17, BLOOMSBURY SQUARE, LONDON.

ELIAS BREMRIDGE, Secretary and Registrar.

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MAJOR, MINOR AND MODIFIED EXAMINATIONS.

The Board of Examiners for England and Wales meets at 17, Bloomsbury Square, London, in February, April, June, July, October, and December, and the Board of Examiners for Scotland meets at 119A, George Street, Edinburgh, in January, April, July, and October, for the purpose of conducting the above Examinations. Candidates must give notice to the Registrar in London, and pay the fee on or before the *first* day of the month in which the Examinations are held. Each candidate for the Major and Minor Examinations must, at the time of giving notice, produce a Registrar's Certificate of Birth, and a certified declaration that for three years he has been registered and employed as an Apprentice or Student, or has otherwise for three years been practically engaged in the translating and dispensing of prescriptions. Printed forms of declaration may be obtained from the Registrar in London. Each Candidate for the Modified Examination must state the number of the receipt for his declaration and his age at the time of giving notice.

Candidates will receive notice of the date on which they will be required to present themselves.

In the practical portion of the Major Examination standard works of reference are provided for the use of Candidates at the discretion of the Examiner. No other books or memoranda are allowed.

SPECIAL NOTE.

Each Candidate must state, at the time of giving notice, whether he desires to be examined in London or in Edinburgh.

EVENING MEETING.

The next EVENING MEETING will be held on Wednesday, April 4th, 1883, at Eight o'clock.

The Chair will be taken at half-past Eight *precisely.*

Papers intended to be read at that Meeting should be forwarded to the Secretary not later than Wednesday, March 28th, as papers received after that date cannot be announced in the *Pharmaceutical Journal* previous to the Meeting.

ELECTION OF COUNCIL AND AUDITORS.

EXTRACT FROM THE BYE-LAWS.

SECTION 5, CLAUSE 3.—"Any person qualified to vote desirous of nominating any Member for election as a Member of the Council or as an Auditor, shall give notice in writing, with the name and address of the nominee, and, if for the Council, disclosing whether such nominee be or not a Pharmaceutical Chemist, to the Secretary of the Society, *on or before the 24th day of March*, in every year; and the Secretary shall, on or before the 26th day of March then instant, address and send by post to each nominee a notice of his having been so nominated, and inquiring whether he will accept office if elected, and in default of a written reply from such nominee, declaring his readiness to accept office, if elected, being received on or before the 31st day of March then instant, such nominee shall not be deemed eligible or willing to be elected."

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NOTICE TO ADVERTISERS.

GOOD FRIDAY occurring this week, the "**Pharmaceutical Journal**" is published on **Thursday** instead of **Friday**. **Advertisements which arrived after Ten o'clock on Wednesday Morning were too late for INSERTION IN THIS WEEK'S ISSUE**; they shall appear in the number for **March 31.**

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CALE STREET DISTILLERY, LONDON, S.W.

Duty free for Exportation—also best Methylated Spirit at lowest prices.

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R. J. FULLWOOD & CO.

THE ORIGINAL INVENTORS OF THE

PRIME RICH GOLDEN COLOUR CAKE AND PASTE

ANNATTO.

TO BE HAD GENUINE ONLY FROM THE ANNATTO WORKS.

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24, SOMERSET PLACE, BEVENDEN STREET, HOXTON, LONDON. *Established* 1785.

LIQ. SENNÆ DULC. (MOIR'S.)

CONCENTRATED INFUSIONS, DECOCTIONS, EXTRACTS, LIQUORS, etc.

HENRY AYSCOUGH THOMPSON,

22, WORSHIP STREET, FINSBURY SQUARE, LONDON.

Spiritus Ætheris Nitrosi

Guaranteed to contain the proportion of Nitrous Ether directed by the British Pharmacopœia.

Æther Nitrosus and Sol. Ætheris Nitrosi

Respectively 8 and 4 times the strength of the Spirit.

Spirit. Ammoniæ Aromaticus

Distilled from Volcanic Ammonia.

JAMES WOOLLEY, SONS & CO.

Manufacturing Pharmaceutical Chemists, MANCHESTER.

Hunyadí János

CAUTION.—Circumstances which have come to the knowledge of Andreas Saxlehner, Buda Pest, Sole Proprietor of the Hunyadi János Spring, compel him to WARN the British Public against SPURIOUS IMITATIONS. To secure genuineness, purchasers should see that every bottle has on the LABEL the name of

"THE APOLLINARIS COMPANY (LIMITED), LONDON."

FOREIGN
MINERAL WATERS.

FREDERICKSHALL (5 Cases, 6d. per Case less), 28/6 Case, 30 bots.; 40/- Case, 60 ½-bots.
APOLLINARIS, 25/- Case, 50 bots.; 39/- Hpr., 100 ½-bots. Hampers free. 5 °/₀ discount if 20.
HUNYADI JÁNOS (10 Cases, 3/- and 5/- less), 30/- Case, 25 bots.; 50s. Case, 50 ½-bots.

SELTZER ..	11/- Hpr.,	25	bots.
,, ..	15/- Hpr.,	50 ½	-bots.
PULLNA ..	18/- Case,	20	bots.
,, ..	30/- Case,	50 ½	-bots.
VICHY ..	31/- ,,	50	bots.
,, ...	27/- ,,	50 ½	-bots.
CARLSBAD ..	37/- ,,	50	bots.
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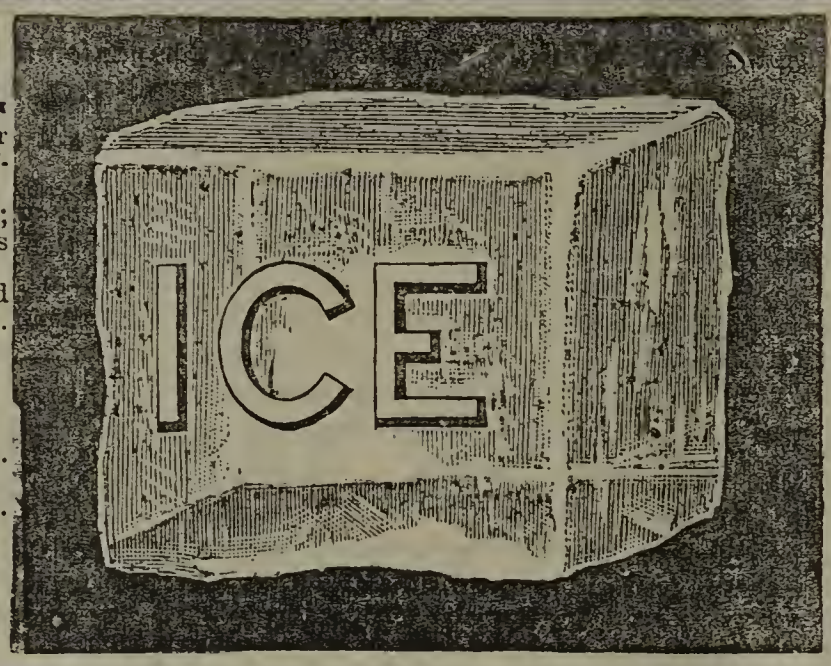
SCHWALLBACH	27/6 ,,	50	,,
HOMBURG ..	37/6 ,,	50	,,
WILDUNGEN	40/- ,,	50	,,



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BLOCK ICE.

Original Blocks, 2s. per Cwt.
Packing and Mats free.
Low quotations given for quantities taken from vessels while discharging.
PRINTED DIRECTIONS for STORING ICE sent free on application.

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The Only Palatable Natural Aperient Water.

THE BEST HOUSEHOLD REMEDY & SPECIFIC FOR CONSTIPATION

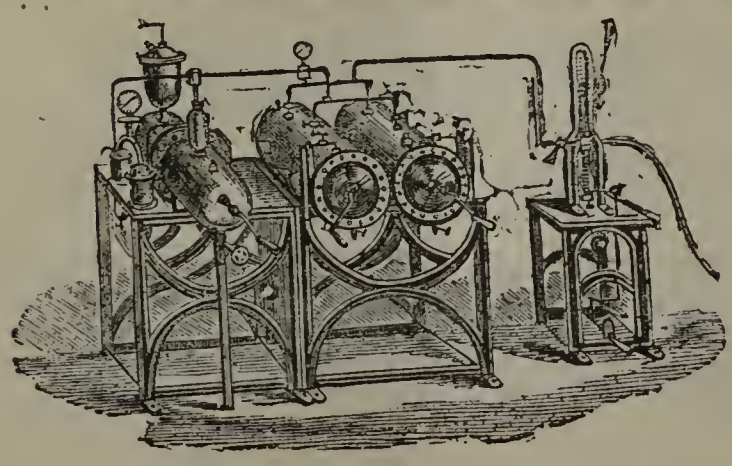
Highest Award at the International Medical Exhibition, 1881. Retail 1/6 & 2/- per Bottle.

A SUPPLY OF CIRCULARS WITH NAME AT FOOT AND DESCRIPTIVE PAMPHLETS FREE ON APPLICATION.

Chemists can safely stock this Water, as it will continue to be well advertised.
It is prescribed by all the leading Medical Men.

ÆSCULAP BITTER WATER COMPANY, Limited, 38, Snow Hill, LONDON, E.C.

SODA WATER MACHINERY,



Patent Stoppered Bottles,
AND ALL APPLIANCES.

Before purchasing send for Catalogues to

DAVENPORT & CO.
99P, High Holborn, London.

Price 10s. per lb.

LIQUOR CINCHONÆ CORDIFOLIÆ

1 to 15.

Thirty minims of this preparation diluted to 1 oz. with distilled water forms the Decotum Cinchonæ Flav. of the Pharmacopœia.

See PHARM. JOURN., *March* 10, 1883.

This well known preparation contains the whole of the alkaloids of bark in combination with the natural acids, and is manufactured with great care by a process specially devised for that purpose.

It is prepared from Calisaya Bark containing a high percentage of quinine and other alkaloids, and the process used ensures that the liquor contains the quinine, and that it is not left behind in the residual bark.

Experiments lately made upon the fluid extracts of bark at present in use show that they are comparatively worthless and most expensive preparations, and that many of them contain scarcely any alkaloid.

This liquor may be depended upon as being a thoroughly representative preparation, and always of uniform composition. It will, therefore, be found invaluable to pharmacists and medical men who require to prescribe an active and reliable preparation of bark.

To be obtained of all Wholesale Houses or from the Manufacturers,

CLEAVER, BUCKWELL & CO.

9, GREAT CASTLE STREET, W.

Since the introduction of Pepsine by BOUDAULT and Dr. L. CORVISART, BOUDAULT'S Preparations have been considered the most reliable.

BOUDAULT'S PEPSINE.

The Paris Hospitals have used no other.

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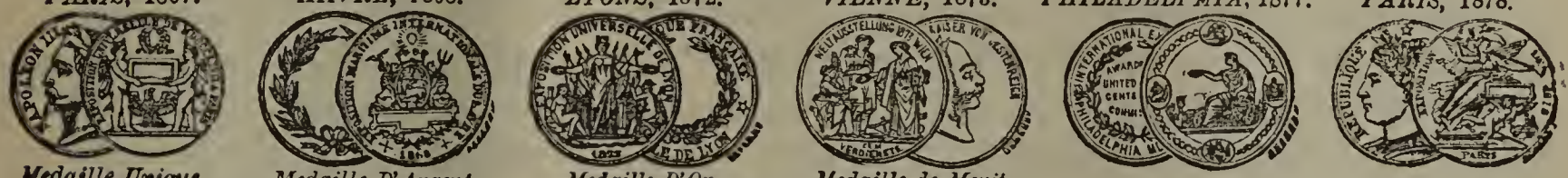

Medaille Unique. *Medaille D'Argent.* *Medaille D'Or.* *Medaille de Merit.*

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BOUDAULT'S PEPSINE—dose, 5 to 10 grains—in bottles, one ounce, 5/-; in bottles, half-an-ounce, 3/-
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NUBIAN LIQUID WATERPROOF BLACKING,

THE ORIGINAL AND SELF-SHINING. ☞ NO BRUSHES REQUIRED.

Easily applied with sponge attached to the cork. Keeps its polish for a week in all kinds of weather. Cleanest, Best, and Cheapest for Boots, Shoes, Harness, and all Leather Goods.

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In Glass Bottles and Cartoons.

Easily applied with sponge attached to cork. Will not smear or clog, and produces a brilliant polish with little labour. Price **6d.**

LADIES' "PET" BOOT POLISH.

A Light Dressing for Ladies' and Children's Boots.

A Preparation which does not soil the most delicate clothing, and will not harden or crack the leather or peel off. Price **6d.** per Bottle.

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SOMETHING NEW

ELEGANCE AND DURABILITY COMBINED.

PATENT RECESS LABELLED SHOP ROUNDS. Parties about to Open New Establishments or Refit Old Premises, should compare following Net Prices. *These Prices include Glass Labels attached to Bottles ready for use.*

Size.	Height.	Flint Glass. N.M.	Flint Glass. W.M.	Blue Glass. N.M.	Blue Glass. W.M.	
16 ounce	8 inches	16/6	18/6	20/	22/	per dozen.
20 ,,	9 ,,	17/6	20/	21/	23/	,,
32 ounce	10½ inches	20/	22/	22/	26/6	per dozen.
42 ,,	11 ,,	22/	25/6	26/6	30/	,,

Prices of other Shop Bottles &c., on application. *Sample Bottle sent on receipt of* 1s. 7d. *in stamps.* *Fac-Simile* sheet Labels, in various styles, sent on receipt of two stamps. *Amongst others, the following parties have recently been supplied with these Bottles:—*

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Beckwith, H. B., Grenada
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Brunton, W. W., South Kensington, London
Carruthers & Allan, Dumfries
Catford, O. W., Crewkerne, Somerset
Cullen & Co., South Norwood, London
Cummings Bros., Dundee
Day, J., Savile Town, Dewsbury
Gardner, A. W., Auckland, N.Z.
Gibbs, R. D., Smethwick
Keith, John, Kirkgate, Leeds
Kinninmont, A., Glasgow
Lodge, G. H., Rotherham.
Macfarlane, A. Y., Edinburgh
Mason, W. D., Grimsby
Maston, G., Hartlepool
McCaul, J. & G., Londonderry
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Morris, J. L., Moss Side, Manchester
Noble, A., Galashiels
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Pattison, H., Coleham, Shrewsbury
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Smith, Albert, Ilfracombe
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36s.
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AND
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AND
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120s.
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Terms and Discounts forwarded on receipt of application stating quantity required. Large buyers liberally treated with. Illustrated Price Lists of all kinds of Bottles on application to KILNER BROTHERS, 10, Great Northern Goods Station, King's Cross, London.

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MESSRS. A. ROWLAND & SONS, OF 20, HATTON GARDEN, LONDON, beg to announce that their Macassar Oil can now be had in a Golden Colour, as well as in the usual tint. This Golden Macassar Oil is specially suited for fair-haired children and people. Sizes and Prices as usual.

ROWLANDS' EUPLYSIA

Is a botanical wash for cleansing the hair and skin of the head from all impurities, scurf or dandriff.
2s. 6d. per Bottle.

ROWLANDS' EUKONIA

Is a fragrant toilet powder, lately much improved. Each box has inside the lid a certificate of purity from Dr. Redwood, Ph.D., F.C.S., &c.
Sold in three tints: white, rose and cream, 2/6 per Box; double that size with puff, 4/-

Counter Bills and Dummies can always be had on stating to what Wholesale House in London they may be sent for enclosure.

A. ROWLAND & SONS, 20, HATTON GARDEN, LONDON,

Will always be glad to advertise in any price lists, almanacks, &c., published by chemists, on receipt of particulars.

PRICE'S PATENT CANDLE COMPANY (Limited).

Works:—Battersea, London, & Bromborough, Liverpool.

Price's Pure Glycerine for Medicinal Purposes.

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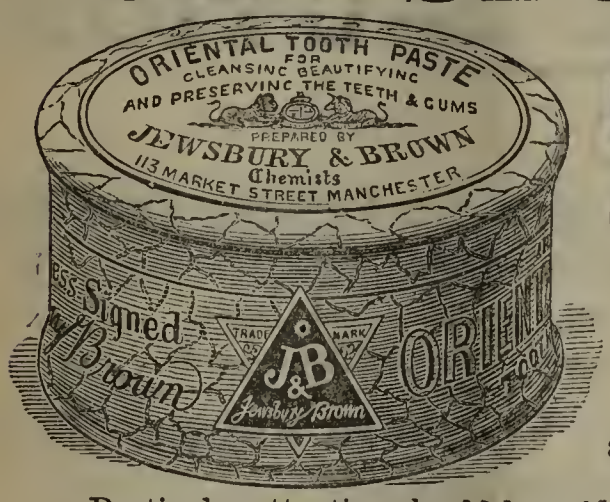
Price's Glycerine Soaps.

Price's Carbolic Disinfecting Soaps, for Nursery, Bath-room and Household Purposes.

Price's Carbolic and Glycerine Soap.

JEWSBURY & BROWN'S ORIGINAL ORIENTAL TOOTH PASTE.



SOLD AT 1/6 & 2/6 PER POT.

This old-established Dentifrice has been **Fifty Years** before the public.

IT IS WARRANTED TO RETAIN ALL ITS VALUABLE PROPERTIES IN ANY CLIMATE.

The **ORIGINAL** and **ONLY GENUINE** is manufactured solely by

JEWSBURY & BROWN,

CHEMISTS, MANCHESTER,

and is distinguishable by the **AUTOGRAPH SIGNATURE** of the Proprietors on each wrapper and the **TRADE MARK** on the label round the pot.

Particular attention should be paid to this guarantee of genuineness, as numerous imitations are offered.

The Trade and Shippers supplied by the leading houses in London and elsewhere. Bills and Show Cards forwarded by the Proprietors, JEWSBURY & BROWN, Manchester, on receipt of address card, and directions for enclosure.

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SPECIAL DISTILLATION OF

ESSENTIAL OILS

LAVENDER, ROSEMARY, FENNEL, ORIGANUM, SPIKE, RED AND WHITE THYME.

SAMPLES SENT ON APPLICATION.

ALLEN & HANBURYS'
EFFERVESCENT APERIENT SALINE

This is a finely granulated preparation, which in dissolving produces a sustained sparkling effervescence, and a clear, bright solution. It possesses all the advantages of an agreeable saline, combined with the anti-febrile properties of Chlorate of Potash, of which it contains a considerable percentage. It is, in short, an efficient aperient and febrifuge, and makes an exceedingly pleasant and refreshing beverage.

PRICES. THIS SALINE IS SUPPLIED IN BULK AT

1s. 6d. per pound; 1s. 5d. per pound for 14 pounds; 1s. 4d. per pound for 112 pounds; or in ½-pound bottles (to retail at 1s. 6d.) 11s. per doz.

With or without Labels. It is supplied also on the same terms with A. & H.'s own Labels and Wrappers ready for Retail Sale. SAMPLES FREE ON APPLICATION.

MANUFACTURED BY

ALLEN & HANBURYS, PLOUGH COURT, LOMBARD STREET, LONDON.

LIEBIG COMPANY'S EXTRACT OF MEAT

The only brand warranted genuine by Baron Liebig.

CAUTION.—Numerous inferior and low-priced substitutes being in the market with misleading titles, labels and portraits of the late Baron Liebig, purchasers must insist upon having the Liebig Company's Extract of Meat.

N.B.—Genuine ONLY with facsimile of Baron Liebig's Signature, in blue ink, across label.

SPECIAL NOTICE & CAUTION

BRAND & CO.

The original Manufacturers of Essence of Beef (green label under wrapper), and other Specialities for Invalids, have

NOT REMOVED

From their SOLE ADDRESS, No. 11, LITTLE STANHOPE STREET, MAYFAIR, W., and caution the trade to

BEWARE OF IMITATIONS.

GREAT REDUCTION IN PRICE.

LIEBIG'S EXTRACT OF MEAT

NOTE PRICE!!!

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Australian Meat Co.
9 & 11, Fenchurch Avenue, LONDON, E.C.

7-lb. Tins	...	per lb.	5/11	... each	41/5
1-lb. Jars	...	„	6/2	per doz.	74/-
½-lb. „	...	„	6/4	... „	38/-
4-oz. „	...	„	6/7	... „	19/9
2-oz. „	...	„	7/-	... „	10/6
1-oz. „	...	„	7/8	... „	5/9

We pay Carriage on Extract Orders if amounting to 10 lbs. weight or over. Packages free.

ROBINSON'S ORANGE WINE

(VIN. AURANTII, B.P.)

Specially prepared for Quinine Wine, does not deposit, will keep good in any Climate, and well adapted for Export Trade. Supplied in Casks containing 9, 18, 30, 60, or 120 Gallons. Terms on application.

THE UNIVERSAL CORN AND WART PENCIL.

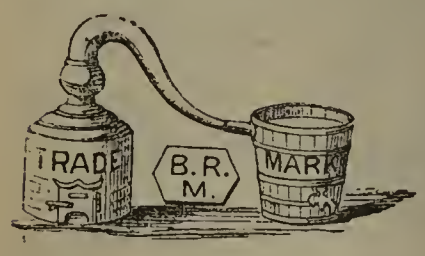
1 doz. mounted on a handsome Illustrated Show-Card, Retail, 6d. each; Wholesale, 3s. 6d. per doz. It is especially adapted for Export Trade, and may be safely sent to the hottest climates, as each glass tube is hermetically sealed and enclosed in a cardboard case.

N.B.—The above is exempt from Stamp Duty by permission of the Board of Inland Revenue.

CONCENTRATED WATERS.—One Ounce of these Waters added to

Forty Ounces of Distilled Water forms a clear Medicated Water (without filtering), similar in every respect to those prepared according to the directions of the British Pharmacopœia, and free from all Chemical impurity. They are prepared to supply a want long felt by Chemists and Medical Men, and by their use a fresh supply of any of the Medicinal Waters may be obtained at a moment's notice. They are not affected by age in any climate. N.B.—Used in the proportion of one part to thirty-two of water they represent the Medicinal Waters of the *United States Pharmacopœia.*

	Per lb.		Per lb.		Per lb.
Aqua Anethi, Concent. ...	4/0	Aqua Cinnam. Ver. Concent.	6/0	Aqua Fœniculi, Concent. ...	4/0	Aqua Pimentæ, Concent....	4/0
,, Anisi ,, ...	4/0	,, Cassiæ ,,	4/0	,, Menth. Pip. ,, ...	4/0	,, Rosæ ,, ...	/6
,, Camphoræ ,, ...	4/0	,, Flor. Aurant. ,,	8/6	,, ,, Ang. Con. ...	6/0	,, Rosæ Virgin ,, ...	0/6
,, Carui ,, ...	4/0	,, Flor. Sambuci ,,	8/6	,, ,, Virid. ,, ...	4/0		



The above are put up in Bottles of ½ lb. or 1 lb. and upwards, each of which has the Inventor's Protection Label over cork.

Wholesale Agents—Hearon & Co., Maw, Son & Thompson, Lynch & Co., London; Evans, Sons & Co., Liverpool; Woolley, Manchester; Bewley & Draper, Hunt & Co., Dublin; Glasgow Apothecaries' Co., Hatrick & Co., Glasgow; Raimes & Co., Duncan, Flockhart & Co., Edinburgh; Foggitt, Thirsk; Goodall & Co., Leeds; J. Richardson & Co., Leicester; Slinger & Son, York; McKesson & Robbins, New York. Special Terms for large quantities may be had from

B. ROBINSON,

Distiller and Brewer of British Wines, Church St., Pendleton, Manchester.

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PURE CRUSHED LINSEED

IS NOW REDUCED TO **19/-** PER CWT.

(In smaller quantity, 20/- per cwt.)

"NOTHING FINER CAN BE OBTAINED." NO OIL EXTRACTED.

STEAM MILLS, FARRINGDON ROAD, E.C.

GOODYEAR RUBBER COMPANY

NEW YORK, U.S.A.

MANUFACTURERS OF

SYRINGES, ENEMAS, &c.

LAWRENCE BROS. 48, Farringdon St. E.C.

SOLE AGENTS FOR GREAT BRITAIN.

JUST OUT.

THE UNIVERSAL INHALER

EARTHENWARE, with burnt-in Directions for Use. To Retail at 2s. 6d. Per doz., 18s. The cheapest and best Inhaler in the Market.

MENTHOLEUM.

A new remedy for Neuralgia.

Conical shape, in Paper Boxes ... ... per doz. 4/0
Nickel-plated Bottles ... ... „ 8/0

Very saleable.

THROAT SPRAY.

Glass, with india-rubber ball and tube, retail 3/6 ... ... per doz. 27/0

FRENCH STICKING PLASTER.

(*Sparadrap Agglutinatif.*)

10d. per yard.

Will adhere to a fresh wound. Always soft and pliable. Will not irritate the skin.

ABSORBENT COTTON WOOL.

Is more readily adapted to the size of a wonnd than Lint. Absorbs a large quantity of water ... ... per lb. 2/6

POROUS PLASTERS.

Strengthening ... ... per doz. 2/0
Belladonnæ ... ... „ 2/6
Poor Man's ... ... „ 2/0

COUGH MIXTURE BOTTLES.

(Panelled Green Glass.)

2-oz.	3-oz.	4-oz.	
8/6	9/0	9/6	per gross.

FLOATING LIGHTS (B. & T.'s).

These give a better light and burn longer than any other. In boxes containing 60 and 120 lights ... ... per doz. 4/0, 8/0

OPAQUE GLASS POTS,

For Vaseline, Cold Cream, &c.

½-oz.	¾-oz.	1-oz.	1½-oz.	2-oz.	
1/6	1/8	1/10	2/0	2/3	per doz.

JAPANESE "CURL" PAPER.

As soft as silk.

In packets of 500 ... ... per doz. 4/0

FRENCH MUSTARD LEAVES.

Four in a packet, twelve packets mounted on a show card... ... ... per doz. 4/0

THE NEW WIRE TUBE CLEANER

(Marshall's Patent.) 1d. size ... per gross 9/0
2d. size ... „ 18/0

The best and most popular Feeding Bottle is "The Pet." We have 22 varieties, of which the following are the most saleable. See detailed Price List.

			per doz.
		TO RETAIL AT SIXPENCE.	
No. 1.	...	Upright shape, green glass, white fittings	3/6
„ 6.	...	Bent neck, do. do.	3/6
„ 10.	...	Do. screw glass stopper	4/-
		Black fittings, 3d. per doz. extra.	
		TO RETAIL AT ONE SHILLING.	
No. 13.	...	Bent neck, flint glass, pot caps	7/-
„ 15.	...	Do. do. all india rubber fittings	8/-
„ 16.	...	Do. do. screw glass stoppers	7/6
„ 18.	...	Do. do. screw metal caps	7/6
		With black fittings, 6d. per doz. extra.	
		TO RETAIL AT ONE SHILLING AND SIXPENCE.	
No. 20.	...	Bent neck, gilt metal caps, black fittings...	12/-
„ 21.	...	Do. gilt china caps, do.	12/-
„ 22.	...	Do. screw glass stopper, do.	10/6

Our new Supplement and Catalogue, containing all the latest Novelties, will be sent post free on application.

TRADE MARK. JOHNSON BOURNE LATIMER 35 CASTLE St. HOLBORN LONDON.

BOURNE, JOHNSON & LATIMER

(*BOURNE & TAYLOR*)

Wholesale and Export Druggists' Sundriesmen,

35, CASTLE STREET, HOLBORN, E.C.

ACETIC ETHER.*

ITS TRADE COMPOSITION, MANUFACTURE AND SPECIFIC GRAVITY.

BY WILLIAM INGLIS CLARK, D.SC.,

Pharmaceutical Chemist.

In the spring of 1882, while working with a sample of acetic ether, supplied by an eminent London firm, I was surprised to find that the addition of dry potassium carbonate to it resulted in the production of a lower layer of solution, and I arrived at the conclusion that the so-called acetic ether contained a certain amount of water. Further investigation led me to examine the acetic ether supplied by other makers, with the result that in only one case did I find the commercial article to resemble what it professed to be. I may mention that I have not examined any samples guaranteed chemically pure, but have confined myself to the samples known as pure acetic ether in the London and other markets. Before giving you the results of this examination, I propose to explain the analytical methods adopted in estimating the acetic ether and alcohol present.

1. *Estimation of Real Acetic Ether.*—In this I followed the method recommended in Allen's 'Organic Analysis,' vol. i., p. 141. A solution of caustic potash in pure rectified spirit (free from aldehyde, the presence of which, by the formation of aldehyde resin, renders titration very difficult), of the strength of about 8 per cent. real KOH is prepared, and its alkalinity accurately determined by standard sulphuric acid; 50 c.c. of this solution are transferred to a strong glass flask, and to this are added 5 c.c. or a weighed quantity of the sample of acetic ether under examination. The flask may be either closed with a rubber stopper, securely tied down, or connected with an inverted Liebig's condenser, and it is then heated in a water-bath for three hours. Having allowed the flask to cool, the contents are carefully washed into a beaker, and the alkalinity determined. The loss of alkalinity evidently represents the amount of acetic or other acid which has been present in the ether, either free or in combination. "Each c.c. of *difference* between the normal sulphuric acid *originally* and *ultimately* employed represents one equivalent in milligrammes (·088 grms.) of the ether present."

The reaction corresponds to the following equation:—

$$C_2H_5C_2H_3O_2 + KOH = KC_2H_3O_2 + C_2H_5OH$$

the resulting products being potassium acetate and ethyl alcohol. To reduce the *weight* of acetic ether obtained to *volumes* it is only necessary to divide by ·901 the specific gravity of acetic ether (·898 according to Allen).

It is, of course, necessary to determine the percentage of free acid present in the acetic ether. This is easily obtained by dissolving 5 c.c. of the ether in proof spirit and titrating with standard alkali. I may here call attention to the necessity of previously neutralizing the acid present in the proof spirit or taking it into account in the estimation. The following example is taken from my note book:—

Sample A. 5 c.c. ether taken.

50 c.c. sol. KOH alcoholic neutralized	52	c.c. standard H_2SO_4.
Free acid in 5 c.c. acetic ether	= 5·1	c.c. standard alkali.
Alkalinity before action	= 46·9	c.c. standard H_2SO_4.
Alkalinity after action	= 9·1	c.c. standard H_2SO_4.
Loss	= 37·8	c.c. standard H_2SO_4.

Acetic ether = 37·8 × ·088 = 3·3264 grams.
3·70 c.c.
74 per cent.

2. *Estimation of Alcohol.*—Having first ascertained the percentage of acetic ether present, the amount of alcohol is determined by taking advantage of the reaction between acetic ether and caustic potash, for which I have already given an explanatory equation in reference to the estimation of acetic ether. We saw that the final products were potassium acetate and ethyl alcohol, and if we can determine the total amount of alcohol after the action is complete, we have a ready means of knowing how much was present originally in the free state. You will of course understand that any ether (sulphuric), aldehyde, or other volatile substances present in the acetic ether will prevent the process being absolutely accurate, unless these are estimated and allowed for; but as these do not occur to any great extent, the process is sufficiently accurate for ordinary purposes.

The "*modus operandi*" is as follows:—

In a flask connected with inverted Liebig's condenser, place 200 c.c. of the ether under examination (or any less quantity) along with 200 c.c. of water and about 120 grams caustic potash in sticks. In a short time reaction spontaneously occurs, but to complete this the flask is heated on a water-bath for two hours and allowed to cool. Another 200 c.c. of water are now added, and distillation carried on till 500 c.c. in all have passed over. This contains all the alcohol and it may be readily estimated by the Sikes hydrometer, or the careful determination of specific gravity. By subtracting the amount corresponding to the acetic ether known to be present, we know how much was present as alcohol.

In giving the approximate composition of trade samples, I regret that I have only been able to procure eight of these, representing, however, most of the makers (two from scotch houses, one of German manufacture, the others, believed to be of English manufacture, from London), acetic ether not being an article of large consumption.

From a glance at the accompanying table it will be seen that of these only one contains over 75 per cent. of real acetic ether, while in one case only 30·6 per cent. were present.

Table showing Approximate Percentage Composition of Acetic Ether (1882).

	Parts by Volume. A.	B.	C.	D.	E.	F.	G.	H.
Acetic ether ($C_2H_5C_2H_3O_2$)	90·14	74·8	67·02	60·0	46·1	41·7	31·4	30·6
Alcohol absol. (C_2H_5OH)	7·2	22·8	21·93	24·3	37·4	33·4	48·0	32·8
Ac. acetic glac. ($HC_2H_3O_2$)	trace	·9	·30	·4	trace	2·0	1·1	7·0
Water, ether, etc.	2·66	1·5	10·75	15·3	16·5	22·9	19·5	29·6

In order to see whether the large percentage of free alcohol and the water had been added intentionally or were the result of careless manufacture,

* Read at an Evening Meeting of the North British Branch of the Pharmaceutical Society, March 14, 1883.

I have made an extensive examination of the more commonly accepted processes, and present the more important results to you now. These processes may be at once divided into two classes, viz., those in which acetic acid is made to act in the free state on alcohol in presence of sulphuric acid, and those in which it is liberated from an acetate in presence of alcohol.

No. 1. In the 'Year-Book of Pharmacy' for 1881, p. 68, a modification of the first of these is given, which resembles the continuous process in ether making, and is highly recommended. Equal parts of sulphuric acid and alcohol are placed in a retort, heated to 140° C., and a mixture of equivalent parts of acetic acid and alcohol run in, the temperature being kept nearly stationary. It is stated that 90 per cent. of the theoretical yield of ethyl acetate may be obtained. I made several trials of this process and give below the results of one operation taken more in detail. I regret that I did not accurately estimate the yield of acetic ether, but the specific gravity indicates the composition to some extent.

Forty-five ounces each of sulphuric acid and s. v. rect. were heated to 140° C. and into this was slowly run a mixture of—

Glacial acetic acid (6 lbs.)	91 fl. oz.
Alcohol, 56 o. p.	104 fl. oz.

The following fractions were obtained:—

275 c.c.	sp. gr. 766
235 c.c.	sp. gr. 807
900 c.c.	sp. gr. 837-883
505 c.c.	sp. gr. 890–900
985 c.c.	sp. gr. 907-917
1475 c.c.	sp. gr. 925–935
1365 c.c.	sp. gr. 940

i.e. 1915 c.c. below sp. gr. 900.
985 c.c. below sp. gr. 907–919.
2840 c.c. above sp. gr. 925.

From these figures it will be apparent that at first a large amount of ethyl oxide was produced, while during the last half of the operation combination took place very imperfectly. Were the process of any practical value I would give details as to the purification of this sample, but the large amount of ethyl oxide, free alcohol and free acetic acid at once shuts out this method of manufacture.

The other similar plans in which the acetic and sulphuric acids along with the alcohol are distilled together are open to the same objections, though to a less degree.

No. 2. *Action of Carbonic Acid on Potassium Acetate.*—In Allen's 'Organic Analysis,' reference is made to this little known process. Potassium acetate is dissolved in absolute alcohol and carbonic acid passed through. The potassium carbonate being insoluble, is supposed to be precipitated, and only acetic ether remains. I was unable to detect a trace of acetic ether when absolute alcohol was used, even after passing carbonic acid (dry) through for twenty-four hours, but by adding water till solution of the acetate was obtained a slight action took place, but not to any practical extent.

Thus:—Potassium acetate	13¼ ounces.
Rectified spirit	283 c.c.
Water	57 c.c.

when treated with CO_2 for twenty-four hours and distilled, gave—

275 c.c. containing 1 per cent. ethyl acetate.

No. 3. *Action of Sulphuric Acid on Acetates.*—A. *The B.P. Process.*—As in other cases, where chemical substances of definite composition are in the Pharmacopœia, the directions do not bind us to any special method of manufacture, the ultimate purity of the product being secured by the tests appended. So it is in this case, the formula being given and the specific gravity and boiling point almost coinciding with those of the pure substance. The specific gravity is given as about 900, practically agreeing with that of the pure article, sp. gr. 901, as obtained by myself. There is much confusion in text books as to the real specific gravity.

Thus:—Bache says	·866	at 15° C.
Cooley and 'Dict. Chem. Manuf.'	·890	
U. S. Pharm.	·889-897	
Gmelin (authorities) . . .	·812-930	
Squire	·900	
Mendelejef	·8981	
Gössman	·932	at 20° C.
Kopp	·9104	at 0° C.

In any case there can be no doubt that a pure article was intended, and not such an one as would include the samples, the composition of which I have already referred to. Indeed, in their case the sp. gr. (which at any rate is no evidence of purity), differed widely from that of the B.P. The numbers obtained were 892, 910, 912, 894, 904, 908.

The B.P. says it may be obtained by distilling a mixture of dry acetate of soda, 8 parts; rectified spirit, 5 parts; sulphuric acid, 10 parts, adding the distilled product to half its weight of chloride of calcium in a stoppered bottle; letting them remain together for twenty-four hours, and then decanting and rectifying the ethereal liquid.

I accordingly took—

Alcohol, 56 o.p.	283 c.c.
Sulphuric acid	566 c.c.
Mixed, cooled, and added,	
Sodium acetate, dried	453·6 grams.

After thorough mixing, the flask was heated on a water-bath with inverted condenser for two hours to ensure complete reaction, and the contents distilled. Let me here give a warning with regard to the addition of the sodium acetate. Unless great care be taken, loss of ether will occur from the sudden heat evolved, and an efficient condenser should be at once attached. A still more important point is to ensure thorough decomposition of the acetate before beginning to distil off the ether. Should this be overlooked and the mass gather into knots, as soon as nearly all the ether (and of course along with it the uncombined alcohol) has passed over, the sodium sulphate will melt, and, along with the sulphuric acid, form a viscid liquid, which acting on the knots of acetate of sodium gives rise to sudden and violent frothing, which may readily burst the flask. When the mixing has been carefully attended to the distillation goes on quietly till the end. In the B.P. process, in which, as we shall afterwards see, large excess of sulphuric acid and sodium acetate are added, the action is specially violent and knots form readily, with the result that frothing is very persistent and commences early in the distillation.

To return to the operation: 372 c.c. of distillate were obtained, sp. gr. ·9185, which on analysis showed 88·18 per cent. ethyl acetate, =294·6 grams, =328 c.c. in all. Following out the directions, I macerated with 171 grams fused chloride of calcium

for twenty-four hours and decanted. I only obtained—

134 c.c., sp. gr. ·930,

and on distillation obtained the greater part, say 130 c.c., sp. gr. ·9024, and containing 91·6 per cent. ethyl acetate, the total yield being thus 119 c.c. I shall again refer to the method of purification later on, but at present I would just call your attention to the extravagance of the B.P. process.

The reaction which goes on may be represented by the equation—

$$NaC_2H_3O_2 + H_2SO_4 + C_2H_5OH = C_2H_5C_2H_3O_2 + NaHSO_4 + H_2O,$$

and the proportions therein indicated correspond closely to—

Rectified spirit	283 c.c.
Sulphuric acid	230 c.c.
Sodium acetate, dried	351 grams,

while in the B.P. an excess of 336 c.c. sulphuric acid and 102 grams sodium acetate are ordered.

We have above assumed an equation representing the action of sulphuric acid on acetate of soda and alcohol; but there is still another equation which might be adduced, in which neutral instead of the acid sodium sulphate is obtained, only half of the sulphuric acid being required.

This is—

$$2NaC_2H_3O_2 + H_2SO_4 + 2C_2H_5OH = 2C_2H_5C_2H_3O_2 + Na_2SO_4 + 2H_2O.$$

Which is correct? To decide this I prepared some acetic ether with the above proportions.

No. 4.	Sodium acetate (dry)	351 grams.
	Sulphuric acid	120 c.c.
	S. v. rect.	283 c.c.

The acid and alcohol were mixed and cooled, thoroughly mixed with the acetate, heated with inverted condenser for one hour, and distilled. This was a matter of difficulty, for owing to the absence of excess of sulphuric acid, the contents of the flask remained unmelted or undissolved, and distillation proceeded but slowly.

400 c.c., sp. gr. ·928, were obtained, which, on analysis gave—

Acetic ether 173·18 grams 192·8 c.c.
Acetic acid $HC_2H_3O_2$ 53·28 grams.
Alcohol and water, the remainder.
The 283 c.c. s. v. rect. = 357 grams acetic ether
The 351 grams sod. acet. = 376 grams acetic ether.

The sulphuric acid is also slightly in excess of what is necessary for the alcohol, and we see that—

If $H_2SO_4 = C_2H_5C_2H_3O_2$, yield should be 178·5 grams
$= 2C_2H_5C_2H_3O_2$, yield should be 357 grams.
Yield actually obtained 173·18 grams,

so that the first given equation is the correct one.

Action of Sulphuric Acid on Acetic Ether.—When sulphuric acid is heated with acetic ether it decomposes it into ethyl oxide and acetic acid, with the formation of numerous compounds dissolved in the sulphuric acid. It will be probable, if this statement be correct, that the effect of using excess of sulphuric acid in the preparation of acetic ether must be to decompose some of it as soon as formed and to lessen the yield. In order to examine this more closely,

I mixed
Acetic ether 200 c.c. (90·14 per cent. by volume)
Acid sulphuric 100 c.c.,

allowed to lie for two days and distilled.

Much sulphurous acid was given off and a treacly residue was left in the flask. The distillate 140 c.c. sp. gr. 925 contained now only 81·32 per cent. of acetic ether, giving the following result:—

	Acetic Ether.	Acetic Acid.
Before . . .	161·92 grams	None.
After . . .	102·25 grams	16·63 grams.
Loss	58·67 grams.	

This fact determined me in examining the production of acetic ether when the theoretical amount of sulphuric acid was used. It will be observed from the equations already given that water is set free in the reaction, and on this account it might be supposed that a slight excess of sulphuric acid would be useful in absorbing this, thus preventing formation of aqueous acetic acid. It is to avoid this that it is recommended to dry the sodium acetate before adding it to the sulphuric acid and alcohol. For this reason also Frankland and Duppa have recommended the use of absolute alcohol, although others have pointed out that a trace of moisture seems to assist etherification. I have accordingly, in dealing with this matter of excess of sulphuric acid, used absolute alcohol, rectified spirit, and crystallized as well as dried acetate of soda.

No. 5. *With Crystallized Sodium Acetate and S. V. Rect.*—

Sod. acet. cryst. 582 grams
S. v. rect. 283 c.c.

	Theoret. H_2SO_4 227 c.c.	Excess H_2SO_4 280 c.c.
Yield . . .	400 c.c. sp. gr. 927	407 c.c. sp. gr. 916
Acetic ether .	266·1 grams	295·8 grams
Acetic acid .	24·4 grams	11 7 grams.

No. 6. *With Dry Sodium Acetate and S. V. Rect.*—

Sod. acet. sic. 351 grams.
S. v. rect. 283 c.c.

	Theoret. H_2SO_4= 227 c.c. (Average of 3.)	Excess H_2SO_4= 280 c.c. (Average of 3.)
Yield . . .	400 c.c. sp. gr. 909	400 c.c. sp. gr. 909
Acetic ether .	318·9 grams	318·5 grams
Acetic acid .	7·1 grams	8·1 grams.

No. 7. *With Dry Sodium Acetate and Absolute Alcohol.*—

Sod. acet. sic. 351 grams
Alcohol absol. 246 c.c.

	Theoret. H_2SO_4 (227 c.c.)	Excess of H_2SO_4 (280 c.c.)
Yield . . .	400 c.c. sp. gr. 912	400 c.c. sp. gr. 911
Acetic ether.	310·2 grams	325·7 grams.
Acetic acid .	19·2 grams	19·2 grams.

Summarizing these results we have—

Table showing Yield with Varying Sulphuric Acid.

Materials.	H_2SO_4	120 c.c.	227 c.c.	280 c.c.	566 c.c. =B.P.
	Yield	grams	grams	grams	grams
Sod. acet. cryst. + s. v. rect.			266·1	295·8	
Sod. acet. sic. + s. v. rect .		173·1	318·9	318·5	294·6
Sod. acet. sic. + alc. absol. .			310·2	325·7	

From these we see (1) that the water in the crystallized salt should be removed; (2) that great excess of sulphuric acid (as in the B.P. process) or deficiency are equally to be avoided; (3) that any advantage gained by using absolute alcohol instead of s. v. rect. is very small and not worth the extra expense; (4) that a slight excess of sulphuric acid is advantageous, and (5) that in no case have I obtained more than 91·2 per cent. of

the theoretical yield. This last is to some extent accounted for by loss from evaporation, etc., etc., as I purposly omitted to pass the uncondensed vapours from the flask through absorbing bulbs; but in every case secondary actions took place between the acetic ether or alcohol and the sulphuric acid which no doubt reduced the yield.

Effects of Delay on the Yield.—Frankland and Duppa recommend that the mixture of alcohol and acid be allowed to lie for some time before addition of the sodium acetate, and that thereafter it is advisable to leave the mixture for some time before distillation. The latter proposal is probably intended to ensure complete decomposition of the acetate, and, in my experience, this is necessary, unless great care be taken in thoroughly mixing the acetate, in which case it can be dispensed with. Before the action of sulphuric acid on ethyl acetate had been satisfactorily made out, I thought that the complete decomposition of the acetate could be most easily effected by heating the flask with inverted condenser for an hour, and all the already detailed experiments were made under this condition. A little reflection will, however, show that if excess of sulphuric acid be present an undesirable opportunity is afforded for the subsequent decomposition of the already formed acetic ether, and I found, by mixing thoroughly in the cold, and immediately heating rapidly and distilling (as described in my "model process" later on), a still larger yield was obtainable.

Thus:—

	Heated for one hour before distilling	Mixed in cold and distilled.
S. v. r. 283 c.c. . .	yields 318·5 grams	338·7 grams
H_2SO_4 280 c.c. . .		
Sod. acet. sic. 351 grms.		

The object of the former, *i.e.*, delay before addition of the acetate, as stated in their paper, was to favour the formation of sulphovinic acid, but in the six annexed experiments on the point I find it to be undesirable; not only is there a smaller yield, but there is a greater residuum of secondary products in the flask, when delay occurs before addition of the sodium acetate.

Table showing Effect of Delay on the Yield.

Average results.	Acetic ether.	Acetic acid.
No delay (av. of 3) . .	318·9 grams	7·1 grams.
18 hours (one trial) . .	301·6 „	6·7 „
48 „ (av. of 2) . .	295·9 „	7·6 „

We have now examined pretty fully the various processes of manufacture (I may mention that my experiments have included the acetates of potash and lead) and it is evident that whether we use the B.P. process or any one of the modifications of it, using rectified spirit, absolute alcohol, dried or even crystallized sodium acetate, in every case *even without purification*, we at once get a distillate purer, stronger and better than any of the commercial articles obtainable, and we are forced to one of two conclusions, either that a wilful adulteration has been practised or that the manufacture has been accomplished in a careless manner, by the distillation of free acetic acid, sulphuric acid and alcohol. It may be asserted that as acetic ether gradually decomposes in presence of moisture into acetic acid and alcohol, the samples under discussion were at first of greater strength and had deteriorated by keeping; but this is inadmissible, for in the first place, the free acetic acid is, after all, so small, that were it in combination the composition would be but slightly altered, and, secondly, I have again estimated the free acid after keeping the samples from one to nine months and find no great change, as shown in the following table:—

Table showing Increase in Free Acid by Keeping.

	Free acetic acid in 100 c.c. acetic ether. At first.	After keeping.	Increase.
A . .	Only two days in possession.		
B . .	·998 grms.	9 months. 3·484 grms.	2·486 grms.
C . .	Only one day in possession.		
D . .	·442 „	3 „ ·422 „	None.
E . .	None kept.		
F . .	2·121 grms.	9 „ 3·168 „	1·047 „
G . .	1·248 „	9 „ 1·742 „	·494 „
H . .	7·440 „	1 „ 7·440 „	None.

Up to this point we have dealt only with the subject of manufacture, and the purification of the acetic ether must now receive our attention. You may perhaps think it sufficient if I say how to purify it; but the right understanding of this depends so much on knowing how not to purify it, that I make no apology for dwelling on this point at length, and bringing in some experiments which have at first sight little to do with the main question.

From a careful study of the subject of manufacture we learn what are the impurities to be removed from the acetic ether. These are ether, products resulting from the secondary action of sulphuric acid, acetic acid, alcohol and water. Of these, the first two can be most easily removed by distillation; but the ether, at least, is only present in a badly manufactured preparation, and I therefore shall not refer to it again.

The acetic acid is present in all samples of crude acetic ether, though in some cases to a very slight extent, and is most easily removed by agitating the ether with a solution of an alkaline carbonate. If the sample is free from water the acetic acid is not readily removed by dry potassium carbonate, but the addition of a few drops of water facilitates the absorption of the acid.

The removal of alcohol is not so easily effected, and although, as I shall afterwards show, it is quite easy to obtain an article, at the first distillation, free from alcohol, yet the examination of the methods usually employed have, in my hand, yielded such interesting results that I must refer to these more fully.

It will be remembered that in the B.P. process a large excess of sodium acetate and sulphuric acid are employed, with the evident intention of ensuring the absence of alcohol in the resulting product, and I find that this object is attained; but we also noticed that it is directed to add to the distillate half its weight of chloride of calcium (fused); allow to stand for a night, decant and distil. The chloride of calcium is added to remove alcohol or water, and the use of it has been advocated or objected to by various writers. Chloride of calcium forms with acetic ether a crystalline compound, and in the B.P. process so large a proportion is absorbed by it that only a very small amount (174 c.c. out of 372 c.c.) is separable by decantation. The addition of water separates the acetic ether, but at the same time destroys any advantage that had been gained by the use of the calcium chloride. In this dilemma some have adopted distillation from fused calcium chloride, a plan which others have objected to on account of the bumping which occurs during the distillation, owing to the solubility of the chloride in acetic

ether. In my opinion a much more serious objection (and one which I nowhere find alluded to) lies in the decomposition which occurs. Fused calcium chloride is always alkaline, and the free lime decomposes acetic ether with the production of alcohol and calcium acetate. In addition to this the distillate has a somewhat pungent smell, the cause of which I have not determined, and after all it is not even comparatively pure acetic ether. Thus in the B.P. process, ·372 c.c. containing 88·18 per cent. of acetic ether, when treated with calcium chloride, decanted and distilled, gave only 130 c.c. containing 91·9 per cent.; an enormous loss with only an impure product.

The solubility of calcium chloride in acetic ether is not great, and I have determined it by estimating the chlorine in a given volume of the ether after digestion with the chloride.

At 0° C.—100 c.c. acetic ether dissolve ·3688 gram $CaCl_2$.

At 15° C.—100 c.c. acetic ether dissolve ·15008 gram $CaCl_2$.

Use of Solution of Calcium Chloride.—Saturated solution of this salt has the property of absorbing water and alcohol, while it does not, to any great extent, dissolve acetic ether.

In 'Year-Book of Pharmacy,' 1881, p. 68, M. Pabst is represented as affirming "pure ethyl acetate is insoluble in a solution of calcium chloride; but if it contains 30 per cent. alcohol, calcium chloride solution dissolves appreciable quantities. A mixture of 1 volume ethyl acetate and 1 volume alcohol forms a homogeneous mixture with 2 volumes of a solution of calcium chloride."

This statement I believe to be incorrect, and in support of this I adduce the following experiments made with an acetic ether 96·36 per cent.

Five c.c. acetic ether were placed in a burette and sol. $CaCl_2$ saturat. added to it in successive quantities of 10 c.c. When 40 c.c. in all were added the acetic ether measured only 4·15 c.c. showing a loss of ·85 c.c. We therefore find—

1 c.c. acetic ether (99·36 per cent.) soluble in 47 c.c. sol. calc. chlorid. sat. at 15° C.

and *very slightly more soluble at* 0° C.

The second part of the statement I find to be also incorrect, as will be seen from the following table, and this seems accounted for by the evident fact that M. Pabst, by his own process (which I previously discussed), had obtained and was using an impure acetic ether. I have already shown that acetic ether is slightly soluble in solution of chloride of calcium, and I have also determined the amount of absorption which takes place when acetic ether diluted with alcohol, water, or both together, is shaken with an equal volume of the saturated solution, and on this, at first sight, untrustworthy basis I have worked out a rapid process of examining acetic ether, which gives fairly approximate results.

Table showing the Action of Sol. Calc. Chlor. Sat. on Acetic Ether (99·36 *per cent.*) *at* 15° *C.*

A. Diluted in Absolute Alcohol.

Equal parts of Dilute Acetic Ether and Calcium Chloride solution.

Acetic ether (99·36 p.c.). Parts.	Alcohol. Parts.	Ether separated. Parts.	Error. Per cent.
100		97	− ·3
90·9	91·1	91·1	+ ·2
83·4	16·6	83·75	+ ·35
71·5	28·5	68·5	− ·3
62·5	37·5	52·8	− 9·7
55·6	44·4	38·9	− 16·7
50·0	50·0	26·7	− 23·3
45·5	54·5	16·1	− 29·4
41·7	58·3	7·5	− 34·2
38·5	61·5	None separated.	

B. Diluted with Alcohol and Water.

Acetic ether (99·36 p.c.). Parts.	Alcohol. Parts.	Water. Parts.	Ether separated. Parts.	Error. Per cent.
100			97	− 3
90·9		9·1	87·2	− 3·2
83·4	8·3	8·3	82·3	− 1·1
76·9	15·4	7·7	77·6	+ ·7
66·8	26·6	6·6	66·5	− ·3
58·9	35·2	5·9	53·2	− 5·7
47·7	38·0	14·3	41·8	− 5·9
40·0	40·0	20·0	33·4	− 6·6
37·2	37·0	25·8	32·4	− 4·8

From these tables it will be seen that as long as the percentage of acetic ether ranges between 75 per cent. and 90 per cent., the amount of separable ether fairly agrees with that known to be present, but as the percentage becomes less and less the ether separated varies according as the diluting agent is alcohol alone or along with water. It would have been easy to construct a table which would apply to all mixtures of acetic ether and absolute alcohol, but as water is constantly present we must resort to a very simple device. In the first place, we must have some pure acetic ether as a standard, and having shaken up 10 c.c. of the sample under examination with 10 c.c. solution calcium chloride, note how much ether separates. If this amount be more than 75 per cent. the result may be taken as nearly correct, but if less, we must add pure acetic ether to the sample in such proportion as will ensure the final per cent. reaching 75 per cent. Thus, if only 30 per cent. separated we know from the tables that the sample must contain something between 30 and 55 per cent., and we therefore add to it twice its volume of pure acetic ether (the per cent. then being at least 76 per cent.) and taking 10 c.c. of the mixed sample again shake with 10 c.c of the chloride solution and note how much separates. If, say 8·0 c.c. separate, subtract 6·5 c.c. (the amount corresponding to the two volumes of pure ether added) and we have 1·5 c.c. as the ether from 3·33 c.c. of the sample = about 45 per cent. It is of course desirable to work with, say 20 c.c. or 30 c.c. when the sample is very impure; but it must be remembered that the results are not within 1 per cent. of the truth, and this method should not be resorted to when the method first described is applicable.

It may be said that in this discussion we have lost sight of the purification of the acetic ether from alcohol, but it will be noticed that in the solution of calcium chloride we have an excellent means of removing any alcohol present. If the percentage be but small, a single washing with an equal volume will practically effect separation, and we may now therefore consider—

2. *Removal of Water from Acetic Ether.—To what extent is Water Soluble in Acetic Ether?*—I do not find this question answered in references to this ether, and I have accordingly determined not only this point, but the converse, viz., the solubility of acetic ether in water. These two inquiries have

brought out a most instructive lesson, one which shows forcibly how easy it is to fall into error in deductions from a few experiments. When (about) 34 c.c. of acetic ether and 10 c.c. of water are shaken together in a stoppered burette (temperature 15° C.), on standing exactly 34 c.c. of acetic ether and 10 c.c. of water separate again, and shall we therefore say that the liquids are non-miscible? At first we might think so; but a little reflection will show that if they are not, they must be reciprocally soluble in the proportions we have alluded to, *i.e.*, that the ether must have dissolved exactly as much water as the water dissolved ether; and that this is the true explanation is evident from the appended tables.

Table shoowing the Addition of Water to Acetic Ether at 50° F.

	Water.	
10 c.c. acetic ether + 10 c.c.	= 9	c.c. ether undissolved.
10 c.c. acetic ether + 20 c.c.	= 8	c.c. ether undissolved.
10 c.c. acetic ether + 30 c.c.	= 7	c.c. ether undissolved.
10 c.c. acetic ether + 50 c.c.	= 4·7	c.c. ether undissolved.
10 c.c. acetic ether + 70 c.c.	= 2·2	c.c. ether undissolved.
10 c c. acetic ether + 80 c.c.	= 1	c.c. ether undissolved.

On cooling now to 0° C., the whole of the ether dissolved after standing, while on heating to 15° C., 1·8 c.c. separated again. From these and duplicate experiments, I find—

Solubility of acetic ether in water = 1 c.c. in 8 c.c. at 0° C.
Solubility of acetic ether in water = 1 c.c. in 9 c.c. at 15° C.

Table showing Addition of Acetic Ether to Water at 15° C.

	Water.	
10 c.c. water + 50 c.c. acetic ether	= 7·5	c.c. undissolved.
10 c.c. water + 100 c.c. acetic ether	= 5·5	c.c. undissolved.
10 c.c. water + 150 c.c. acetic ether	= 3·5	c.c. undissolved.
10 c.c. water + 200 c.c. acetic ether	= 1·5	c.c. undissolved.
10 c.c. water + 250 c.c. acetic ether	= all dissolved.	

When cooled to 0° C., about ·05° c.c. separated again.

Solubility of water in acetic ether = about 1 c.c. in 26 c.c. at 0° C.

Solubility of water in acetic ether = about 1 c.c. in 24 c.c. at 15° C.

We have thus the following curious results:—

Calcium chloride more soluble in acetic ether at 0° C. than 15° C.
Water less soluble in acetic ether at 0° C. than 15° C.
Acetic ether more soluble in sol. calc. chlorid. at 0° C. than 15° C.
Acetic ether more soluble in water at 0° C. than 15° C.

Dried potassium carbonate is usually employed to dry the acetic ether, and Berthelot has recommended that it should be finally distilled off this salt; but I have found this to decompose the ether. In preparing a pure sample for examination I distilled it, after digestion, with potassium carbonate and found—

Before distillation 93·48 per cent. $C_2H_5C_2H_3O_2$.
After distillation 90·14 per cent. $C_2H_5C_2H_3O_2$.

I therefore again heated the 90·14 per cent. lot with potassium carbonate in a water-bath for one hour. A green colour was developed along with a disagreeable odour, and on distillation the product only contained 86·22 per cent. $C_2H_5C_2H_3O_2$. Digestion with the carbonate, however, does not decompose acetic ether, and in the course of a few days it will be found practically dehydrated.

I have also made use of dried sodium acetate, which on the large scale is undoubtedly the best to use, since distillation over this has no decomposing effect, and after drying, the acetate may be again used in preparing acetic ether.

We are now in a position to decide on a process to be adopted, and I would therefore propose that in the next Pharmacopœia the following or a modification of it should be adopted:—

Rectified spirit . . .	283 c.c. = 10 oz.
Sulphuric acid . . .	283 c.c. = 10 oz. fluid.
Dried sodium acetate .	351 grams = 12⅜ oz.

Place the alcohol in a copper or glass flask, and into it pour the sulphuric acid, adopting means to keep it cool. Allow to stand, and when the temperature has fallen to about 60° F., gradually add the sodium acetate with constant agitation, to insure thorough mixture, keeping the flask as cool as possible, and connecting it with an inverted condenser to avoid loss. When all has been added, connect with a condenser, and distil the contents by means of a naked flame or sand-bath till 400 c.c. (about 14 fl. oz.) have passed. Digest the distillate for three days with 2 ounces of freshly dried potassium carbonate. Filter and distil the filtrate by the aid of a water-bath, stopping the distillation before the last ounce has passed over.

I have already discussed the process of manufacture so fully that I need hardly say more with reference to the one just detailed; but a few points merit attention. By the excess of sulphuric acid ordered, the absence of alcohol in the distillate is secured, while the action of this excess on the newly formed acetic ether is minimized by the directions to secure thorough mixture before applying heat. Alcohol being absent in the distillate it is only necessary to neutralize and free the ether of water. I recommend for this purpose the potassium carbonate, as most convenient on the small scale, but the sodium acetate is equally efficient.

As an example of the operation of this process I give the following details:—

Using the quantities above mentioned I distilled off—

375 c.c., sp. gr. ·912, containing 94·06 per cent. acetic ether.
30 c.c., sp. gr. ·912, containing 81·42 per cent. acetic ether.

The 375 c.c. contained	316·8 grams	or	352·7 c.c.	acetic ether
30 c.c. „	21·9	„	24·4	„
	338·7		377·1	„

After washing with water, and digestion with potassium carbonate, the sp. gr. was found slowly to diminish—

After eighteen hours	·904
After thirty hours	·9023

when it contained 99·36 per cent. real acetic ether.

I must here enter a protest against some of the characters of acetic ether given in the B.P., and also in the new United States Pharmacopœia.

The solubility in water is given as—

B.P.	1 in 12 parts (vol. or weight?)
New U.S.P. . . .	1 in 17 parts by weight.
While I find it to be	1 in 9 parts by vol.

Again, as regards specific gravity, I have already pointed out the great diversity among observers as to the real sp. gr. of pure acetic ether; and this, no doubt, arises from the impurity of the article examined; but looking to the latest authorities only we find—

B.P., corrected addendum . .	·900.
U.S.P. (1883)	·889 to ·897.
Mendelejef and Allen.	·898.

After much work on the subject I am convinced that in all these cases the acetic ether contained alcohol or some other light liquid, and the following are my grounds. I took two samples of acetic ether, one known to contain alcohol (A), the other known to contain water (B). I distilled A, dividing the distillate into fractions, and by analysis having selected the purest of these, sp. gr. about 890, I twice shook up with an equal volume of calcium chloride solution, digested with excess of potassium carbonate, filtered, distilled, rejected the first portions and selected the middle portion. On analysis it showed 95·04 per cent. ethyl acetate. After prolonged digestion with pot. carb. sic., and afterwards with cupri sulph. sic. for ten days, it was sp. gr. 9004 and contained 98·76 per cent. ethyl acetate. I now washed it with water to remove any trace of alcohol still remaining. The watery acetic ether was now sp. gr. ·909 at 60° F., I divided it into two portions (1 and 2), and set aside—

1. 100 c.c. + 20 grams . . .	Sod. acet. fused.
2. 100 c.c. + 20 „ . . .	Pot. carb. sic.

and noted the lowering of the sp. gr.—

In 48 hours.	In 72 hours.
1. ·90191	·9014.
2. ·90205	·9018.

I then mixed them (170 c.c. in all) distilled off 40 c.c., which I rejected, and retained the next 75 c.c., sp. gr. 9015 and containing about 99·4 per cent. ethyl acetate.

On the other hand, I took sample B containing water, but no alcohol, and digested it for some weeks with pot. carb. and cupri sulph. sic. and finally distilled, selecting fractions by analysis as before, and obtained—

Sp. gr. ·902	= 99·36 per cent.
Sp. gr. ·9015	= 99·58 „
Sp. gr. ·9012	= 99·70 „

To sum up: we see that it is exceedingly difficult to obtain anhydrous acetic ether, the last traces of water obstinately adhering, and we can have no doubt as to the accuracy of the determination (oxalic acid from methyl oxalate having been used in the preparation of the standard solution). In the absence then, of an absolutely pure sample we may reason as follows. Sample A after purification, but before treatment with water, was—

Sp. gr. ·9004 and 98·76 per cent. ethyl acetate
B = sp. gr. ·9012 and 99·7 per cent. ethyl acetate,

and as A originally contained alcohol, while B contained water, it would seem most likely that the sp. gr. of the former would be too low while that of the latter would be too high. But by purifying A so as to remove the alcohol the sp. gr. was raised to

Sp. gr. ·9015 and it then contained about 99·4 per cent.

so that on all grounds the sp. gr. must be higher than ·9004 and lower than ·9012.

It is of course not to be expected that such purity will be met with, but I see no reason why 95 per cent. or even higher should not be insisted on in the Pharmacopœia.

In closing this discussion, I am aware that some, perhaps many, of my deductions may hereafter be proved to be incorrect, and it is in order that subsequent experimenters may know the grounds on which these were based that I have troubled you with such complexity and detail.

Postscript.—Since writing the foregoing it has been suggested to me that the *parts* in the B.P. formula may be intended to be taken by weight. When working on the subject the question as to what was meant came up, there being an undesirable ambiguity in the wording of the process. Opinions of those consulted agreed in giving the solids by weight, liquids by measure. This view was also confirmed by the statement in the text that "1 part dissolves in 11 or 12 parts of water at 60°," which was understood by all to mean parts by volume. On consulting Squire on the subject, I found "solids by weight, liquids by measure," at the top of the page, showing that according to English usage the sulphuric acid and alcohol were understood generally to be parts by measure. On this ground I examined the process, and founded the objections above detailed, the more serious of which, as will be seen, lie, not so much in the formula, as in the method of purification. If we, however, calculate out the proportions as represented by weight as well as by measure, it seems probable that all the parts are intended to be taken by weight, and that if this be so, the proportions in themselves are satisfactory enough. The following figures indicate this:—

1st. *Liquids and Solid by Weight.*

500 grams s. v. rect. . . = 420 grams absolute alcohol.
1000 grams sulphuric acid = 960 grams H_2SO_4.
800 grams sod. acetate.

But 420 grams alcohol require 895 grams sulphuric acid and 748 grams dried sodium acetate, showing in this case a slight excess of these bodies.

2nd. *Liquids by Measure, Solid by Weight.*

500 c.c. or 419 grams s. v. rect. . = 352 grams C_2H_6O.
1000 c.c. or 1843 grams sulphuric acid . . . . . = 1769 grams H_2SO_4.
800 grams acetate of soda,

But 352 grams C_2H_6O require 750 grams H_2SO_4.
352 grams C_2H_6O require 627 grams $NaC_2H_3O_2$.

So that in this case the proportions are very much further, than in the former case, from the theoretical. It is to be regretted, therefore, that if the former be the correct reading, the wording is not so framed as to avoid all doubt, and I would suggest that in that case the solubility should be expressed in similar terms.

LITHIÆ CITRAS.*

BY C. THOMPSON.

It is very difficult to say when this salt was first used in medicine. Dr. Ure, in 1843, introduced the carbonate as a specific for gout, pointing out the remarkable solvent power of lithia over uric acid compared with the other alkalies, hence its great use in cases of gout. The urate of sodium with which gouty patients all seem charged, is converted into the more soluble lithia salt, and so washed out of the system.

In 1857, Drs. Garrod and Ringer mention using strong lotions of lithia salts to disperse gouty swellings. Lithium citrate was not officially recognized until 1864, when it appeared in the new British Pharmacopœia of that date. It appeared in the United States Pharmacopœia of 1870, also in the revised edition lately published, and these are the only two Pharmacopœias in which it is recognized.

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* Read before the Chemists' Assistants' Association, February 21, 1883.

The German Pharmacopœias of 1872 and 1882 have the carbonate, but not the citrate, and the same is the case with the French Codex.

The instructions for making this salt are different in each Pharmacopœia.

In the British of 1864, the directions are—

Take:—

Carbonate of lithia	50 grs.
Citric acid in crystals	90 grs.
Warm distilled water	1 fl. oz.

Dissolve the citric acid in the water and add the carbonate in successive portions, applying heat until effervescence ceases, and a perfect solution is obtained. Evaporate by a steam or sand bath until water ceases to escape, and the residue is converted into a viscid liquid. This should then be dried in an air oven at about 240° F., then rapidly pulverized, and enclosed in a stoppered bottle. The process in the British Pharmacopœia for 1867 is exactly the same.

In the United States Pharmacopœia for 1870, we find:—

Take of—

Lithium carbonate	100 grs.
Citric acids in crystals	200 grs.
Distilled water	2 fl. ozs.

Dissolve the citric acid in the water, gently heated, and to the solution gradually add the carbonate until perfectly dissolved, heating the mixture, so long as effervescence is produced. Evaporate by means of a steam or sand bath to a viscid consistence, dry the residue in an oven, at a temperature of about 240° F., then rapidly pulverize, and preserve in a stoppered bottle.

In the revised Pharmacopœia of the United States, lately issued, no process is in accordance with the decision to omit processes except where necessary to ensure a particular result.

Neither the proportions of the British Pharmacopœia nor that of the United States Pharmacopœia are correct, for the former having an excess of carbonate gives an alkaline product, whereas the latter, having an excess of citric acid gives an acid product.

As Mr. Umney pointed out in a paper read at the Pharmaceutical Conference of 1875, if the formula—

$$3Li_2CO_3 + 2(H_3C_6H_5O_7,H_2O) = 2Li_3C_6H_5O_7 + 5H_2O + 3CO_2$$

be accepted as correct, then 100 parts of carbonate of lithium will be required to neutralize 189·2 parts of citric acid, the product of anhydrous lithium citrate being identical with the amount of citric acid originally employed in the operation. But as the best commercial carbonate of lithium does not contain more than 98·5 per cent. of real carbonate, the proportion will be 100 parts of carbonate to 186·5 parts of citric acid.*

Lithium citrate, according to Mr. Umney, when prepared from these proportions and dried until anhydrous, is neutral to test paper.

According to the 1864 Pharmacopœia, lithium citrate is a white, amorphous powder, *deliquescent*, and soluble in water without leaving any residue. Heated to redness it blackens, evolving inflammable gases, and the residue, neutralized by hydrochloric acid, yields with rectified spirit a solution which burns with a crimson flame. Twenty grains of the salt burned at a low red heat, with free access of air, leave 10·6 grains of white residue.

The U.S.P. of 1870 gives the following characters and tests by which this salt may be recognized:—

"A white powder, *deliquescent* and soluble in 25 parts of water; upon ignition it leaves a residue which if dissolved in dilute muriatic acid gives a solution, which burns with a crimson flame, showing the presence of lithium. The citric acid is indicated by the solution becoming turbid when heated with lime-water and clear again on cooling. Twenty grs. of this salt burned at a low red heat, with free access of air, should leave $10\frac{6}{10}$ grs. of white residue. The revised edition, before alluded to, gives a much fuller account of the characters and tests.

"A white powder, *deliquescent* on exposure to air, odourless, having a slight cooling, faintly alkaline taste, and of a neutral reaction, soluble in 5·5 parts of water at 15° C. and in 2·5 parts boiling water; only slightly soluble in alcohol. When exposed to a red heat, the salt chars, emits inflammable vapours, and finally leaves a black residue having an alkaline reaction, which imparts a crimson colour to a non-luminous flame. The aqueous solution of the salt mixed with test solution of calcium chloride deposits a white precipitate on boiling. On dissolving the residue left on ignition in diluted hydrochloric acid, and evaporating the filtered residue to dryness, 1 part of the residue should be completely soluble in 3 parts of absolute alcohol, which when ignited, should burn with a crimson flame, and the addition of an equal volume of stronger ether to the alcoholic solution should produce no precipitate (salts of alkalies absent). On dissolving another portion of the residue in a small quantity of water, the solution should produce no precipitate with the test solution of ammonium oxalate (salts of alkaline earths). The aqueous solution should remain unaffected by sulphuretted hydrogen or ammonium sulphide (absence of metals)."

Lithium citrate, as Squire remarks, is not deliquescent. It appears in commerce either as a crystalline or pulverulent substance. When crystalline its composition is exceedingly uniform; when in powder its composition is rather apt to vary, and does not resemble the citrate of lithium of the B. P., which is anhydrous; whereas Mr. Umney found, in an examination of some ten different samples, in no case more than 84 per cent., while most were about 74 per cent. of anhydrous salt.

Mr. Umney dried the specimens examined first at 100° C., and then finished at 115° C., or so as to produce the official article; the difference between the two dryings is about* 5 per cent., corresponding to about 1 molecule of water, so that, if the formula $Li_3C_6H_3O_7.4H_2O$ be accepted, then the salt dried at 100° will lose three of these four molecules of water. This was the composition of some crystals of pure lithium citrate, made by Mr. Sandford and presented to Mr. Umney, which contained about 73 per cent. anhydrous citrate.

Out of four samples examined by me, one contained 86 per cent., another 83·5 per cent., and the other two 75·2 per cent. of anhydrous citrate of lithium.

But not only does the commercial article contain water of crystallization, but other substances, distinct impurities,† the most common of which are calcium, magnesium, potassium and sodium, and sometimes traces of the heavier metals. Occasionally the citrate is found adulterated with powdered petalite, bitartrate of potassium, etc. Before proceeding to discuss the methods of detecting and estimating these impurities it will be as well to see how they get into the citrate.

There are two sources:—

1st. The carbonate of lithium.

2nd. The citric acid.

The chief impurities in the carbonate are calcium, potassium and sodium chlorides.

The citric acid may contain tartaric acid, salts of potassium and calcium, together with iron, lead and copper.‡

The mineral lepidolite, a silicate of aluminium, potassium and lithium.

Petalite, a silicate of aluminium, sodium and lithium.

* In some formulæ for new medicaments adopted by the Paris Pharmaceutical Society, it is recommended to use 100 parts carbonate of lithium to 186 parts citric acid (*Pharm. Journ.*, July 21, 1877).

* Since writing the above, Mr. Umney has found that this varies considerably.

† Mr. W. L. Scott, out of twenty-seven samples of lithium salts, found sixteen pure, six fair, and five adulterated with Na_2CO_3,$KHC_4H_4O_6$, powdered petalite, etc., etc. ('Year-Book of Pharmacy,' 1870, p. 452).

‡ A. H. Allen, *Chem. News*, xxxi., 277.

Triphyline, a phosphate of iron, manganese, sodium and lithium, and

Spodumene, another silicate of aluminium, sodium and lithium, are the principal sources whence the lithium carbonate of commerce is derived.

A description of two of the processes by which the carbonate of lithium is prepared from lepidolite, etc., may be interesting, as showing how the impurities before alluded to come to be present in the carbonate.

1. Schering's process for obtaining lithium carbonate from lepidolite, which is the greatest source of the lithium.—The lepidolite is ground up, treated with strong sulphuric acid. It is heated with constant stirring until it gains consistency enough to be made into balls, which are then introduced into a reverberatory furnace. The slight excess of sulphuric acid is driven off at a gentle heat, the temperature is then raised, and the pieces, while still hot, are treated with water in vessels lined with lead Silica is then removed by filtration, and to the lye sufficient carbonate of potassium is added to convert all the alumina present into alum, as lithium does not replace potassium in alum. The alum meal separating on boiling is removed, and the small remaining quantity of alum is precipitated by milk of lime; all the lyes are united, the salts converted into chlorides by treatment with barium chloride, the liquid is evaporated to dryness, and the lithium and calcium chlorides are extracted with absolute alcohol in order to separate them from the barium, sodium and potassium chlorides present. The calcium is separated by ammonium oxalate. Any heavy metals which may happen to be present are got rid of by ammonium sulphide. The lithium chloride is evaporated to dryness in a large silver vessel, treated with ammonia and ammonia carbonate and the resulting lithium carbonate washed to free it from chlorides.

2. Frost's method, for obtaining lithium carbonate from lepidolite.—Fuse together lepidolite, well powdered, 10 parts; barium carbonate, 10 parts; barium sulphate, 5 parts; potassium sulphate, 3 parts. The heavy silicate and sulphate of barium sink to the bottom, whilst a layer of sulphates of potassium and lithium floats on the surface of the fused mass. These are then extracted by lixiviation, and the sulphates are converted into chlorides by precipitation with chloride of barium. The liquid is evaporated to dryness and the potassium and lithium chlorides are separated by treatment with a mixture of absolute alcohol and ether, which dissolves the lithium and leaves the potassium. Ammonia and ammonium carbonate are then added and the carbonate of lithium is collected and well washed. It will be seen that the impurities, *i.e.*, the calcium, potassium and sodium chlorides, are very difficult to separate entirely from the lithium, owing to the partial solubility of potassium and sodium chloride in alcohol.

Both the B.P. and the U.S.P. recommend, as a means for the quantitative estimation of the citrate, incineration, at a red heat, and weighing the residue as carbonate, when 53 per cent. (52·8 per cent.) should be obtained.

This method is useless as a means of estimation of the amount of lithium present, for the carbon cannot be entirely got rid of without very prolonged heating, by which means the carbonate becomes caustic; the resulting greyish-white mass is very deliquescent, thus introducing another source of error.

An improvement on this method is given in the 'U.S. Dispensatory,' where it is directed to incinerate and treat the mass with sulphuric acid, and weigh the resulting sulphate of lithium.

100 grains citrate should yield 22·3 grains of sulphate.

In making an analysis of lithium citrate, the probable impurities and adulterations to look for are powdered petalite or lepidolite, salts of calcium, potassium and sodium.

First as regards powdered petalite or lepidolite. Take a weighed quantity (1 to 2 grams.), and treat with boiling water; if any of the powder remains insoluble, this must be collected, washed, incinerated and weighed. For calcium:—Take about 5 grams, dissolve in water, add ammonium oxalate, collect, wash, incinerate and weigh as $CaCO_3$.

The real difficulty is when it comes to the estimation of the potassium, sodium and of the lithium present in the samples. There are four processes for this, all starting with the salts as chlorides; therefore, a weighed quantity of the citrate is to be taken, incinerated in a platinum crucible, and the greyish-white mass dissolved up in as small a quantity as possible of dilute hydrochloric acid, and then having the salts present as chlorides, either one of the following four processes may be proceeded with.

1. Kobell separates the potassium by precipitation as platino-potassium chloride, and separates the sodium and lithium by heating the mixed chlorides to incipient fusion in a platinum crucible (care must be taken not to raise the temperature too high, or else some of the sodium chloride will be volatilized), then weighs the residue; he leaves it exposed for twenty-four hours to an atmosphere not moist enough to attack the sodium chloride, till the lithium chloride, which is very deliquescent, has absorbed water, drenches the partly deliquesced mass with alcohol, decants carefully, repeats the washing and decantation a second time and weighs the residual sodium chloride.

According to the author this process gives exact results.

2. Mayer's process, as given by Fresenius. Add to the solution (of the chlorides before mentioned) a sufficient quantity of sodium phosphate (which must be perfectly free from phosphates of the alkaline earths—this is very important), and enough soda, either carbonate or hydrate, to keep the solution alkaline; evaporate the mixture to dryness, pour water over the residue, in a sufficient quantity to dissolve the soluble salts by the aid of a gentle heat. Add an equal volume of a solution of ammonia, digest at a gentle heat, filter after standing for twelve hours, and wash the precipitate with a mixture of equal volumes water and ammonia. Evaporate filtrate and first and second washing to dryness, and treat the residue the same way as before. If any phosphate is obtained add it to that previously obtained. The phosphate is then dried and weighed.

The formula of the phosphate is Li_3PO_4 Rammelsberg asserted that a variable quantity of lithium sodium phosphate was formed. Fresenius, however, confirmed Mayer's work, and showed that no double phosphate was formed.

According to Mayer this process gives 99·61 for every 100 of lithium, and Fresenius obtained 99·8 per cent. The phosphate is not a very soluble body, 1 part dissolving in 2539 parts of pure, and 3920 parts of ammoniated water. This is the best and surest method of estimating the lithium.

Another process is to separate the potassium as platino-potassium chloride, then shake the mixed chlorides of sodium and lithium, dried at 120° C., with a mixture of ether and absolute alcohol for twenty-four hours, until the salts are disintegrated, decant on to filter, and treat the residue again with several smaller portions of alcohol and ether. It is best, in order to be as accurate as possible, to distil off the alcohol and ether, and again treat the impure lithium salt with alcohol and ether, a drop of hydrochloric acid being added. This method is not a very reliable one, however.

Bunsen, seeing the difficulty of separating the lithium and sodium by the alcohol treatment, devised an indirect method of determining the potassium, sodium and lithium.*

The solution of the chlorides of potassium, sodium and lithium is treated with nitrate of silver and the total

* Watts's 'Dictionary,' vol. iii.

amount of chlorine present determined; the filtrate is freed from excess of silver nitrate by hydrochloric acid, and the potassium contained in the filtrate determined by platinic chloride. The potassium thus determined, gives, when subtracted from the total chlorides, a remainder:—

$$A = x(LiCl) + y(NaCl)$$

and the quantity of silver chloride equivalent to a known weight of potassium chloride gives, when subtracted from the total weight of silver chloride, a weight B., whence quantity of lithium chloride is calculated by the formula:—

$$x = 1{\cdot}0823\ B - 2{\cdot}6525\ A.$$

As the citrate of lithium in crystals has been shown to be a non-deliquescent body, and all manufacturers now acknowledge that they can make it, although when the Pharmacopœia of 1867 was brought out they were dead against the crystalline article, it is to be hoped that in the Pharmacopœia of the future there will be found the crystalline body as the official citrate.

If this be the case, there will not be much fear of so great a dissimilarity between the commercial article and the official article.

I cannot close my paper better than by giving Mr. Umney's opinion on the crystalline body*:—

"The crystals are quite definite and reliable, and if indeed it were thought necessary to have a citrate containing less water, then let it be dried at 100°, which will be quite enough.

"I suppose the reason why the 1864 Pharmacopœia orders the anhydrous citrate, was to lessen the objections to the salt on account of its supposed deliquescence."

COSMETIC PREPARATIONS.†

Rose-Bandoline.—Digest 800 grains of tragacanth with 1 quart of rose-water for two days at a gentle heat in a closed vessel. Strain the mixture, and perfume it with oil of rose.

Or, macerate 1 part of quince seed with 40 parts of rose-water for several hours, repeatedly agitating; strain the mixture, and perfume it with oil of rose.

Almond-Bandoline.—Prepared like the preceding, except that oil of bitter almonds is used for scenting.

If either of the above are wanted coloured, an ammoniacal solution of carmine may be used.

Brilliantine.—Mix 1 part of glycerin with 3 parts of castor oil and 60 parts of alcohol.

Perfume according to taste.

Crême de Mauve.—Mix 1 part of glycerin with 1 part of alcoholic extract of jasmin, and colour with a little fuchsine.

Used to impart gloss to the hair.

Oleolisse Tonique (de Piver).—Dissolve 5 parts of castor oil in 15 parts of alcohol, and flavour with oil of bergamot or oil of Portugal.

Hungarian Cosmetic.—Melt 30 parts of white wax on a water-bath, and add 20 parts of powdered almond soap, and 20 parts of a solution of 1 part of gum arabic in 60 parts of rose-water. Stir the mixture until it cools, and perfume it with 1 part of oil of bergamot, or $\frac{1}{6}$ part of oil of rose.

By adding umber or lamp-black, the mass may be coloured brown or black.

Bay Rum (artificial):—

Tincture of bay leaves (1 of bay leaves, 10 of alcohol.)	6 ozs.
Oil of bay	60 grains.
Borax	1 oz.
Carbonate of ammonium	1 oz.
Rose-water	1 quart.

Extrait Végétal:—

Essence of vanilla (1 of vanilla, 30 of alcohol.)	2 parts.
Extract of orange flowers	1 part.
„ jasmine	1 „
„ rose	1 „
„ tuberose	1 „
Alcohol	16 parts.
Rose-water	20 „

Amandine (for softening and beautifying the skin).—Make a syrup from 1 part of sugar and $\frac{1}{2}$ part of water. Mix 8 parts of the syrup with 2 parts of almond soap cream, until a homogeneous mass is obtained, to which is to be added, under constant stirring, 200 parts of almond oil, previously perfumed with 2 parts of oil of bitter almonds, 2 parts of oil of bergamot and 1 part of oil of cloves.

The mixture of the almond oil with the syrupy mass requires some practice and, particularly towards the end, when the mass becomes stiffer, a considerable expenditure of force.

Almond Soap Cream is prepared by melting 250 parts of pure lard and mixing with the melted fat 100 parts of solution containing 25 per cent. of caustic potash. The latter must be added very slowly, and under constant stirring. When all is added it is gradually allowed to cool, the stirring being continued. It is then transferred to a mortar, and triturated with addition of 6 parts of alcohol and $\frac{1}{2}$ part of oil of bitter almonds, until it is creamy and homogeneous.

Olivine.—4 parts of powdered gum arabic and 12 parts of honey are intimately mixed, and the mixture triturated with 6 parts of Castile soap and with two yolks of egg for every ounce of gum arabic used. To this is gradually added, under continued trituration, a previously prepared mixture of 60 parts of finest olive oil, 2 parts of oil of sesame, 2 parts of oil of bergamot, 2 parts of oil of lemon, 1 of oil of cloves, $\frac{1}{8}$ of oil of thyme and $\frac{1}{8}$ of oil of cinnamon, and the whole thoroughly triturated until a homogeneous mass results.

Almond Paste.—16 parts of blanched bitter almonds are rubbed to a fine paste, and this is gradually added to an intimate mixture of 30 parts of honey, 15 parts of yolk of egg, 30 parts of almond oil, $\frac{1}{2}$ part of oil of bergamot and $\frac{1}{2}$ part of oil of cloves.

Rose Milk (Lait de Rose).—1 part of finely rasped Castile soap is dissolved, with a very gentle heat, in 4 parts of rose-water; 1 part of white wax and 1 part of spermaceti are next added and, when they are melted, a strained almond mixture is added, prepared from 16 parts of blanched sweet almonds and 1000 parts of water. The addition must be made gradually and under continuous stirring. Finally, 150 parts of alcohol and 8 parts of oil of rose are thoroughly incorporated with the mixture.

Frangipanni Sachet Powder.

Orris root, powdered	1500 parts.
Vetiver, powdered	120 „
Sandal wood, powdered	120 „
Oil of neroli	2 „
„ rose	2 „
„ sandal wood	2 „
Musk bag, powdered	20 „
Civet	5 „

Heliotrope Sachet Powder.

Orris root, powdered	1000 parts.
Rose leaves, powdered	500 „
Tonka bean, powdered	250 „
Vanilla, powdered	120 „
Musk	4 „
Oil of bitter almond	3 „

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* 'Year-Book of Pharmacy,' 1875, page 559.

† From *New Remedies*, February, 1883.

The Pharmaceutical Journal.

SATURDAY, MARCH 24, 1883.

Communications for the Editorial department of the Journal, books for review, etc. should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE DRAFT PHARMACY BILL.

IN the discussion of the Pharmacy Act Amendment Bill by several correspondents and at the various meetings which have been held throughout the country, it appears that there is a tendency to dwell upon the desirability of having the articles proposed to be sold with the label "poisonous" added to the second part of the existing schedule of poisons, rather than dealt with as is proposed in the Bill. Those who advocate this course seem, however, to overlook the circumstance that a special recommendation to that effect has already been made by the Council of the Pharmaceutical Society and that the Privy Council has distinctly refused to sanction such a step. To repeat such a recommendation would, therefore, be futile in itself and calculated, moreover, to injure the prospect of obtaining an amendment of the Act in other respects, since the Government is not inclined to look with favour upon any measure which comprises interference with general trade.

In regard to the particular article which Mr. LEAROYD referred to at the Sheffield meeting, as belonging more properly to the schedule of poisons, we have reason for stating that it was precisely the one which the advisers of the Privy Council most strongly objected to interfering with. It is true that numerous accidents have happened with carbolic acid, in consequence of its misuse or from carelessness, and this has been the case even in hospitals. But with all due regard for the desirability of preventing such accidents as far as possible, it must also be remembered that carbolic acid is an article of great utility as a disinfectant and in constant demand for some purpose connected with sanitation. It is for this reason considered to be unwise to place restrictions upon the supply of this article which would make the procuring of it in some cases difficult or impossible.

Though we have already explained the circumstances which led to the introduction of the second clause of the Bill, and have pointed out that from the view taken by the Privy Council it is an essential feature of the Bill, it is evident that this aspect of the matter has not met with that attention which it demands; for, if that were the case, we should not hear so much of resolutions to expunge this clause from the Bill. As it is probable that members of local associations may exert themselves by communication on the subject with their parliamentary representatives, it seems very necessary to point out the danger that might be incurred if they were solicited to use their influence in a direction at variance with the views of the Government, and also if they were called upon to use that influence in such a way as to show that there was a serious want of agreement among the members of the class seeking amendment of the law.

Another point, in regard to which some difference of opinion exists, is the provision that the seller of a patent medicine insufficiently labelled is to be liable to a penalty, and it has been urged that the manufacturer should more justly be sued in the first instance. Whatever plausibility there may be in this view at first sight, it will we think be found to disappear very completely on further consideration, and especially if it be attempted to formulate the means by which the manufacturer is to be reached. Moreover, some regard must be had to the fact that the chemist is not to be looked upon as selling, like the grocer or oilman, articles of whose nature he does not pretend to have any knowledge. Just as the propriety of limiting to the chemist the sale of patent medicines containing poison can be advocated on the ground that he possesses higher qualifications than the general dealer, so can the duty of carefulness in regard to the sale of such articles be expected from him no less for his own protection than for the public safety. It would be within his power to insist upon a proper observance of the law, and as he would be the only legitimate vendor of such articles there would be little difficulty in securing the observance of it by the manufacturers whose goods he sold. We are glad to observe that these considerations met with recognition at the meetings held at Sheffield and Leeds and that the general result in both cases was approval of the Bill as a useful and desirable means of satisfying public demands and promoting the advancement of pharmacy.

ELECTRICAL TRANSMISSION AND STORAGE OF POWER.

ANOTHER of the very interesting series of lectures on the applications of electricity, now in course of delivery at the Institute of Civil Engineers, was given on the 15th inst., by Dr. C. W. SIEMENS, who took for his subject the "Electrical Transmission and Storage of Power." Referring to the previous lectures, wherein electricity had appeared as a swift and subtle agency by which signals produced by mechanical means or the voice are flashed almost instantaneously to great distances, Dr. SIEMENS said he now introduced electric energy under another

aspect, in which it proved capable of rivalling the steam engine in the accomplishment of actual work. After tracing the steps by which the present methods of converting mechanical power into electric energy have been developed, Dr. SIEMENS proceeded to describe the conditions upon which the working of a well-conceived dynamo machine must depend, and demonstrated that when losses through unnecessary wire resistance, Foucault currents, and induced currents in the rotating armature, are avoided, at least 90 per cent. of the power communicated to the machine could be realized in the form of electric energy, and that this electric energy could be reconverted into mechanical energy with a similarly small loss. By means of two such machines, therefore, at a moderate distance apart, nearly 80 per cent. of the power imparted to the one machine could be again yielded by the other in the mechanical form. Practically the best condition of working consists in giving to the primary machine such conditions as to produce a current of the same magnitude, but of 50 per cent. greater electromotive force than the secondary, and with such an arrangement as much as 50 per cent. of the power imparted to the primary machine can be practically received from the secondary one at a distance of several miles.

But besides the means for converting mechanical power into electric energy, and reconverting it after transmission, the medium for conducting it from one place to another with the least amount of loss has been the subject of much patient investigation. Six years ago Dr. SIEMENS expressed an opinion that a copper rod six inches in diameter would be found capable of transmitting through a distance of thirty miles 1000 horse-power, or an amount sufficient to supply one quarter of a million candle-power, which would suffice to light a moderately-sized town. This suggestion was much criticized at the time, but it bears the test of recent results; for M. MARCEL DEPREZ has lately succeeded in transmitting 3 horse-power a distance of twenty-five miles through a pair of ordinary telegraph wires, 4 mm. in diameter, and calculating from the relative conductivity of this iron wire and the 6-inch copper wire proposed by Dr. SIEMENS, the amount of power that could be transmitted through the latter would be 4000 horse-power. Moreover, M. DEPREZ employed a motor-dynamo of 2000 volts, and was contented with a yield of 32 per cent. of the power imparted to the primary machine, whilst Dr. SIEMENS had calculated upon an electromotive force of only 500 volts, with a return of at least 40 per cent. of the energy imparted. By 1878 Dr. SIEMENS had conceived the possibility of employing a current of at least 1000 volts, and then expressed an opinion that a 2-inch copper rod could be made to accomplish the object intended, whilst Sir WILLIAM THOMSON, enlarging on this idea, soon afterwards told the Parliamentary Committee on Electric Lighting that through a copper wire of only ½-inch diameter, 21,000 horse-power might be conveyed to a distance of three hundred miles with a current of an intensity of 80,000 volts. But Dr. SIEMENS is of opinion that although the time may come when such a current, having a striking distance of about two feet in air, can be dealt with, a fundamental law as to the economical transmission of electricity will probably then be violated, and he is on the whole inclined to abide by his original choice of a 3-inch copper wire.

The application of the electrical transmission of power to railways is perhaps the form in which it has created most public interest. This was first accomplished by Dr. WERNER SIEMENS in 1879, in connection with the Berlin Exhibition, and led to the opening of the Lichterfelde line, 2500 yards in length, which has been in daily operation since May, 1881, and is worked by two dynamos, developing an aggregate of 9000 Watts, or equal to 12 horse-power. In 1881, too, Dr. C. W. SIEMENS established a short line, in connection with the Electric Exhibition in Paris, on which 95,000 passengers were carried within seven weeks. An electric tramway, six miles in length, has just been opened in the north of Ireland, connecting Portrush with Bush Mills. This is at present worked by power produced by a steam engine at Portrush, giving motion to a shunt-wound dynamo of 15,000 Watts (=12 horse-power); but turbines are in course of erection at Bush Mills for the utilization of a waterfall of sufficient power. In the opinion of the lecturer, the electric system of propulsion is already sufficiently advanced to assure practical success under suitable circumstances, as, for instance, suburban tramways, elevated lines, and especially lines through tunnels, such as the Metropolitan and District Railways, the advantages being the saving of the weight of the engine and perfect freedom from products of combustion. For tramways within populous districts the insulated conductor would involve a serious difficulty, and for these it would be more advantageous to resort to secondary batteries carried in the car itself.

The subject of secondary batteries was treated much less fully by the lecturer, who, however, pointed out that it is only since the dynamo machine has become an accomplished fact that this mode of storing energy has become of practical importance, and he gave great credit to Messrs. FAURE, SELLON and VOLCKMAN for putting this valuable addition to practical science into available forms. Fears have been expressed that the permanence of secondary batteries will be affected by their active surfaces becoming coated with sulphate of lead; but the investigations of Mesrs. FRANKLAND, GLADSTONE and TRIBE have shown that the action of the secondary battery depends essentially upon the alternate formation and decomposition of sulphate of lead, and that, therefore, this compound is not an enemy, but the best friend to its continued action.

THE ANNUAL DINNER.

The meeting referred to last week was held at the Society's house, on Wednesday, when a considerable number of gentlemen having expressed their willingness to become Stewards, it was resolved that the Twelfth Annual Dinner of the Members of the Pharmaceutical Society and their friends shall be held at Willis's Rooms, on Tuesday, May 22, and that the price of the tickets, which are to be obtainable only from the Honorary Secretary, shall be one guinea each. It will be remembered that for the past few years the extra expenses in connection with the Dinner have been met by charging the higher sum of thirty shillings for each ticket; but it having been now determined to revert to the earlier charge of one guinea, the extra expenses will this year be defrayed by the Stewards, as formerly. This alteration is calculated to meet the views of many who have objected to the higher charge, and it is to be hoped that in view of the present necessary exchange of opinions in respect to prospective legislation this opportunity for personal intercourse will not be neglected.

A Committee, consisting of the President, Vice-President and Treasurer of the Pharmaceutical Society, and Messrs. Attfield, F. Barron, Butt, Greenish, W. Hills and Paul, was requested by the meeting to carry out the necessary arrangements, and Mr. Richard Bremridge was appointed Honorary Secretary. As, probably, many gentlemen who would like to support the Committee have not yet sent in their names, it has been decided not to close the list of Stewards for publication until Wednesday, the 4th of April. All communications upon the subject should be addressed to the Honorary Secretary, Mr. Richard Bremridge, 17, Bloomsbury Square, W.C.

The last number of *L'Orosi* contains an interesting statistical table, based upon the last census, showing the relative proportion of pharmacists to the population in the different provinces in Italy. From this we learn that with a gross population of 28,951,374, the number of pharmacists in Italy is 11,572 or 1 in 2502. The proportion of pharmacists is, however, by no means constant in respect to the different provinces, since it ranges from 1 in 1396 in Avellino to 1 in 7241 in Cagliari.

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According to the Pharmaceutical Register of New Zealand, a copy of which has just been received, there were at the commencement of the year 256 "pharmaceutical chemists" in virtue of registration effected under the Colonial Act of 1880.

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According to Consul-General Blunt the cultivation of the poppy in Macedonia, where it was introduced from Asia Minor in 1866, is being carried on most successfully. The yield of opium in 1881 amounted to 135,000 lbs., most of which was exported to this country at prices ranging from 12*s.* 6*d.* to 14*s.* per lb. The Macedonian opium, especially that produced in the district of Istip, is said to be of very good quality and to contain about 11 per cent. of morphia.

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The *Utica Herald* reports the proceedings in an action in which a physician sought to recover damages from a chemist for having dispensed a drachm of podophyllin instead of a grain, and thereby endangered the life of a patient. The defence was that "one drachm" was the quantity ordered in the prescription; but the doctor averred that he wrote "one grain," and that an alteration had been made by the chemist to cover his mistake. The prescription was submitted for examination to two experts, who reported that no alteration had been made, and the jury returned a verdict for the defendant. Incidentally, the question was raised whether a chemist is justified in putting up a prescription ordering a dangerous excess of any ingredient, concerning which the judge ruled that if the prescription of a regular practising physician is dispensed as written the dispenser is not responsible.

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According to a recent decision of the Appeal Court at Poitiers, the law which in France prevents pharmaceutical compounds, or remedies of any kind, from becoming the subjects of letters patent extends also to such preparations when intended solely for veterinary purposes.

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A weekly contemporary has furnished a good specimen of "penny-a-lining" *à propos* of the recent explosion. It gravely informs its readers of the remarkable coincidence that Sir Frederick Bramwell was lecturing at the Institute of Civil Engineers upon "the powerful effect of dynamite and the dynamo machine," and had just explained that "so many pounds of zinc would, under certain conditions, produce an explosion of terrific magnitude," when his audience was startled and panic stricken by the effects of the explosion at the offices of the Local Government Board. In the presence of so much that is "remarkable," the fact that Sir Frederick Bramwell was not lecturing at the Institute on that evening is, perhaps, hardly worth mentioning.

* * *

A "Bill for better securing the purity of Beer," which has been brought into the House of Commons, provides that every person who sells or exposes for sale, by wholesale or retail, any beer brewed from or containing any ingredients other than hops and malt from barley, shall post conspicuously in the same place a legible notice stating what other ingredients are contained in it, under a penalty of twenty pounds for a first offence. "Beer" is defined as "beer (other than black or spruce beer), ale and porter."

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A meeting of the School of Pharmacy Students' Association will be held on Thursday, March 29, when a paper will be read on "Vortmann's Method for the Separation of Chlorides, Bromides and Iodides," by Mr. J. B. Barnes. A Report on Botany will be made by Mr. J. O. Braithwaite, the subject being "Plant Movement."

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A paper on "Phosphorus, and a new Method of Exhibiting it in Pill Form," by Mr. Millhouse, will be read at the next meeting of the Chemists' Assistants' Association, on Wednesday the 28th inst.

Provincial Transactions.

MIDLAND COUNTIES CHEMISTS' ASSOCIATION.

A meeting of the above Association was held at Burlington Chambers, New Street, Birmingham, on Wednesday evening, March 14, Mr. Joseph Lucas, President, in the chair.

A paper was read by Mr. David Hooper, F.C.S., on the "Chemistry of British Coinage." The author introduced the subject by remarking on the necessity for a chemical knowledge in the art of fabricating money, and gave some interesting particulars, under the head of "Historical Remarks," of the composition and the fluctuation in the composition of the British coinage from an early period. In dealing with the Mint processes some peculiarities connected with the melting and annealing were referred to and explained, and some of the methods adopted for refining standard gold and silver were discussed, especially the removal of arsenic and antimony by the chlorine process. The parting assays of gold and silver were then described, and the operations of "quartation" and "cupellation" were explained in detail. Some interesting reference was made on the subject of counterfeit coining and methods for its detection were shown. The paper was illustrated throughout by diagrams, specimens of fraudulent coinage, and several tests and experiments.

After a discussion, in which most of the members present joined, a vote of thanks to Mr. Hooper for his interesting and instructive paper was proposed by Mr. Barclay and seconded by Mr. Charles Thompson.

It was then moved that arrangements should be made for monthly meetings of the Association, when papers could be read, and matters of pharmaceutical interest could be brought forward and discussed.

SHEFFIELD PHARMACEUTICAL AND CHEMICAL SOCIETY.

The Annual General Meeting was held in the Society's Rooms, on Wednesday evening, February 21. Mr. Preston, the President, in the chair.

The Secretary, having read the minutes of the previous meeting, which were confirmed, announced that the following donations had been received during the year:—The *Pharmaceutical Journal*, 'The Calendar of the Pharmaceutical Society,' 'The Register of Chemists and Druggists,' from the Pharmaceutical Society of Great Britain; 'The Year-Book of Pharmacy,' from the British Pharmaceutical Conference; and the *Chemists' Journal*, from the Editor.

It was moved by Mr. Ward, and seconded by Mr. Fox, that the best thanks of the Society be given to the respective donors for their kindness in forwarding the same, which was carried unanimously.

The Annual Report was then read by the Secretary. It stated that during the year ten general meetings and seven Council meetings had been held to further the interests of the Society, and for the benefit of the trade generally. The financial condition of the Society was as follows: — Receipts for the current year had been £10 11*s.* 11*d.* This, with the balance in hand of £29 6*s.* 8*d.* from last year, made a total of £39 18*s.* 7*d.* The expenditure for the year had been—Donation to the Trade Association, £10; Rent, £5 10*s.*; Secretarial expenses, £6 0*s.* 5*d.*, making a total of £21 10*s.* 5*d.*, thus leaving a balance in hand at the present moment of £18 8*s.* 2*d.* This showed that the expenditure had been a little in excess of the income, which was accounted for by the cost incurred in removal from one room to another. The Council confidently trusted that the funds of the Society would be augmented by a still further increase in the number of members and associates. The election of delegates to the Trade Association had resulted in Messrs. Jervis and Ellinor being sent to represent their district. In the early part of the year a "Question Box" had been inaugurated, which had proved a source of pleasure and instruction to many members and associates. During the year several papers had been read, and discussions held thereon, on various matters connected with the trade. The Council had pleasure in stating that its efforts in this direction had met with success, the attendance at the meetings having been fairly good. The curriculum as proposed by the Pharmaceutical Society had been discussed at one meeting, and a resolution had been passed supporting the action of the Society. The Council had held a meeting to discuss the proceedings of a person representing a Copying Apparatus Company — the result being that notices were sent out cautioning the trade to be on their guard. It had reason to think that this action in the matter prevented many vexatious proceedings, not only in Sheffield, but throughout the country. The subject of education had not been overlooked during the past year, but as yet nothing definite has been arranged. It was, however, hoped that during the coming year some arrangement might be made with the Firth College authorities as to a course of lectures on Chemistry, Botany, Pharmacy, etc.

It was unanimously resolved—"That the report be adopted and that it be printed and copies be sent to the members of the Society."

The election of officers then took place, the following being elected for the ensuing year:—President; Mr. J. Preston (re-elected); Vice-Presidents, Mr. G. Carr (re-elected), and Mr. J. M. Turner; Hon. Secretary, Mr. G. T. W. Newsholme (re-elected); Treasurer, Mr. W. Jervis; Auditor, Mr. G. A. Cubley; Council, Messrs. Cubley, Ellinor, Fox, Jepson, Learoyd, Mayor, W. Ward, F.C.S., and Watts. Mr. R. Watts was appointed Librarian *pro tem.*

Mr. Ward, in proposing that Mr. Preston be again elected to the Presidential Chair, referred in eulogistic terms to the manner in which he had filled the chair during the past year and said he thought no one was more fit to occupy it during the coming year, when so many matters of importance would come before the Society. Mr. E. R. Learoyd seconded the motion and it was carried unanimously.

Mr. Preston, in thanking the members for the honour they had done him in again electing him President, mentioned several of the more important matters which would come before the Society during the coming year, and said that he felt sure that he should have the support of the members during his second year of office.

The other officers having returned thanks for their election, and votes of thanks having been passed to the retiring officers for their services during the past year, the proceedings terminated.

OLDHAM CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

A very interesting paper was read before the members of the above Association, on Thursday evening, March 8, 1883, by Mr. Smith, on the subject of "Light." The lecturer spoke of reflection and refraction of light, described the eye and the manner in which sight was produced, and explained other phenomena pertaining to the subject.

A vote of thanks to the essayist brought the meeting to a close.

Mr. A. E. Martin, President, occupied the chair.

ABERDEEN CHEMISTS AND DRUGGISTS' ASSOCIATION.

The annual assembly of the chemists and druggists in this neighbourhood was held in St. Katherine's Hall, on Friday, February 9, 1883.

The attendance of the local chemists and their friends

was, as hitherto, of the most gratifying nature. This social gathering has now taken root from the oldest member in the trade to the youngest apprentice, and is looked upon by all as the social desideratum of the season.

LEEDS CHEMISTS' ASSOCIATION.

A lecture was delivered before the members and associates of the Leeds Chemists' Association, on Tuesday evening, February 27, by Mr. Alfred Denny, of the Yorkshire College, "On the Chemistry of Plant Life." The President, Mr. S. Taylor, in the chair.

The lecturer first dealt with the primary elements which chemical analysis shows to exist in every vegetable structure hitherto investigated, and which are absolutely necessary for the life and growth of plants. Of the first importance amongst these indispensable food materials are the elements, carbon, hydrogen, oxygen, nitrogen and sulphur, which the plant obtains from various sources, and by a process of synthesis converts into organic matter. The elements, potassium, calcium, magnesium, iron and phosphorus are also invariably present, and all investigations on the nutrition of plants have established the fact that if one of these substances is absent growth is impossible. The presence of chlorine has been shown to be essential for nutrition in one instance, the buckwheat. Sodium, manganese, silicon are often present in the ash, and in marine plants iodine and bromine. Other elements as aluminium, copper, zinc, barium, etc., are found in rare cases, but their absence does not appear to impair the nourishment of the plant, and it is therefore inferred that they are present rather by accident than otherwise. The sources of the essential food elements, and the mode by which the plant obtains them were next considered. The most important is carbon, which is a constituent of every organic compound and forms nearly one-half of the dry weight of the entire mass of vegetation which clothes our planet. Up to a recent period it was the opinion of botanists that plants obtained their carbon from the carbonaceous substances in the soil, *i.e.*, vegetable mould or humus, etc.; this theory was exploded about forty years ago, when the subject was taken up by agricultural chemists both in this country and on the continent. Many striking arguments were put forward against this theory, perhaps one of the most conclusive being from experiments of Messrs. Lawes and Gilbert, which proved that soil after producing crops for twenty successive years showed little or no decrease of carbon, a fact which alone was enough to crush the humus theory; for in such a case, where the crops were removed as produced, a very inconsiderable amount of carbon could be returned to the soil in the form of decaying tissues as is the case in a state of nature. The carbon dioxide of the atmosphere was next thought of as a possible source of the carbon of vegetable structures, and all investigations from that time to the present have proved beyond all doubt that this is the case. This property of obtaining carbon from the carbon dioxide of the air is possessed by plants only, and only by such plants as contain chlorophyll, the substance which gives to all green plants their colour; chlorophyll only has this power of decomposing carbon dioxide in presence of sunlight. Fungi, and all other plants which do not contain chlorophyll, in common with all animals, are thus unable to appropriate the carbon of the atmosphere and on this account are quite dependent, either directly or indirectly, on green plants for their food, being incapable of producing organic matter from inorganic substances for themselves. Plants obtain their nitrogen from ammonia and certain nitrates in the soil, having no power whatever of making use of the free nitrogen of the atmosphere. Mayer has shown that plants absorb ammonia from the atmosphere, but still if the root supply is cut off they do not thrive. Insectivorous plants obtain nitrogen from animal substances by a process of digestion, similar to digestion in the bodies of animals. Hydrogen and oxygen are obtained chiefly by the decomposition of water absorbed by the roots. Hydrogen may also be appropriated from ammonia and a certain amount of the oxygen resulting from the decomposition of carbon dioxide by the green leaves is also retained for the use of the plant. A small quantity of iron in the soil is indespensable for the production of chlorophyll in exposed parts, and potassium is as essential for the activity of chlorophyll as iron is for its production. The sources of the other materials were also considered. The transformation of these inorganic materials into organic substances is termed assimilation and this property is possessed only by green plants. Starch is usually the first product of assimilation, and is the raw material from which the other organic substances are produced, Starch appears as grains in the chlorophyll corpuscles, but is only formed under the influence of light and within certain limits of temperature. All the after processes which result in the transformation of the products of assimilation, are termed products of "metastasis" or "metabolism." The chief products of metastasis were then considered and also certain bye-products of metastatis termed "products of degradation" which appear to originate as the inevitable results of certain processes, but which have generally no further use in the economy of the plant. The various gums and resins, tannin, colouring matters, alkaloids, acids, volatile oils, etc., and almost all vegetable products that are most useful to man are degradation products.

The Draft Pharmacy Bill.

A meeting of members of the Leeds Chemists' Association and other registered chemists and druggists of Leeds was held at the Church Institute, on Wednesday, March 14, 1883. There was an attendance of between twenty and thirty members of the trade. Mr. Samuel Taylor, President of the Association, was called to the chair.

The Chairman explained that the Committee of the Chemists' Association had felt that the issue by the Council of the Pharmaceutical Society of a draft Pharmacy Act Amendment Bill was a matter of so great interest to all chemists and druggists that it was desirable to take this opportunity for considering and expressing any opinions which might be the result of such consideration. He thought it would be most consistent with the position in which they had been pleased to put him as Chairman of the meeting, that he should not at that time offer his own opinions upon the subject. He would therefore ask Mr. Reynolds to introduce the question by an explanatory statement.

Mr. R. Reynolds then gave an account of the origin of the present measure in the appointment some years since by the Council of the Pharmaceutical Society of a Committee entrusted with the duty of preparing amendments to the existing Pharmacy Act. The communications which have taken place with the Medical Department of the Privy Council were alluded to, and the interchange of views on the subject of regulating the sale of certain poisonous articles, notably the strong mineral acids, which the Privy Council refused to add to the existing Poisons Schedule, but which they regarded as demanding cautionary labels. The numerous accidents which have followed the incautious or ignorant use of patent medicines containing powerful remedies, as morphia and chloral hydrate, had clearly produced an impression on the mind of the Government that something should be done to check the evil. The draft Bill dealt with both these questions in a manner which it was believed had the approval of the Government, and in its whole scope it was calculated to stay those infringements of the intentions of the Act of 1868 which unqualified men acting as companies had been able to commit with impunity. It would have been seen in the newspapers that Mr. Mundella, replying to a question from Mr. Warton, had informed the House of Commons that the

Government would introduce a Bill this session to amend the law on the sale of poisons and also dealing with the question of patent medicines. Hence legislation was imminent, and as practical men they had to consider how far they could agree with the proposals which might commend themselves to the Government, and which evidently had the best chance of being carried.

The clauses of the draft Bill were then considered.

Clause 2 was fully debated.

Some members expressed a wish to see the "poisonous" articles of the Schedule dealt with by the Schedule of the existing Act, the Chairman stating his feeling in favour of such a course, if practicable. Some members thought that the proposed Bill would encourage the public idea that the sale of "poisons" was not confined to registered chemists. It was replied that this could not enable them to make purchases of scheduled "poisons" otherwise than at present, provided the existing Act was enforced, and the recent prosecutions and convictions for breaches of this enactment were cited in proof of the vigilance of those entrusted with the working of the Pharmacy Act.

In the discussion on clause 4, Mr. James Abbott objected strongly to the responsibility placed upon a retailer of any patent medicine found to contain a legal poison, and urged that the maker alone should be responsible. In reply, it was shown that the act of sale was that which constituted an offence, and that the responsibility of the retailer was the principle of existing legislation of an analogous kind, as in the Food and Drugs Act. The power of claiming indemnity from the wholesale dealer was contended to be a very solid protection to the retailer.

At the conclusion of the consideration of the clauses the following resolution was proposed by Mr. Reynolds, seconded by Mr. Smeeton, and carried unanimously:—"That this meeting of members of the Leeds Chemists' Association and other registered chemists and druggists of Leeds has considered the draft Pharmacy Acts Amendment Bill proposed by the Council of the Pharmaceutical Society, and records its cordial approval of the same; those present will use their best endeavours to promote the passing of the Bill by Parliament."

It was then moved by Mr. Chadwick, seconded by Mr. Fawcett, and carried unanimously:—"That the Council of the Pharmaceutical Society be requested to use its best efforts to extend to all chemists and druggists exemption from jury service."

A vote of thanks to the Chairman brought the proceedings to a close.

LIVERPOOL CHEMISTS' ASSOCIATION.

The ninth general meeting of the above Association, was held at the Royal Institution, on Thursday, February 15.

The Secretary announced that he had received a letter from the President, in which that gentleman expressed his regret that he would, owing to illness, be unable to preside. In the absence of the Vice-President, Dr. Symes was, on the motion of Mr. M. Conroy, seconded by Mr. A. H. Samuel, voted to the chair.

The minutes of the last meeting were read and confirmed, and the following donations announced:—The *Pharmaceutical Journal*, from the Society; the *Canadian Pharmaceutical Journal*, from the Editor; the 'Calendar of the Pharmaceutical Society,' from the Society.

Mr. T. F. Abraham then moved that, as owing to the unavoidable absence of several gentlemen, the meeting was unusually small, it be adjourned until a more favourable opportunity.

This arrangement being agreeable to the members present and to Mr. Samuel, the proceedings terminated.

The tenth general meeting was held at the Royal Institution, on Thursday, March 1.

In the absence of the President through illness, and in the absence of the Vice-President and Treasurer, Dr. Symes moved that Mr. John Shaw do take the chair. This was carried.

The minutes of the previous meeting were read and confirmed, and the following donations announced:—The *Pharmaceutical Journal* and specimens of the following drugs, from the Pharmaceutical Society:—*Ammomum aromaticum*, *Scopolia japonica*, Caramana gum, *Aconitum Fischeri*, *Empleurum serrulatum*, *Pimpinella anisatum*, Calumba wood, *Illicium religiosum*.

Dr. Symes showed some new filter papers from which the ash is removed by means of hydrochloric and hydrofluoric acids, the smallest size containing only $\frac{1}{25}$ of a milligram of ash.

Mr. Astrup Carus was then called upon to read a paper upon "Contrivances for the Economy of Fuel and the Abatement of Smoke."

The author, after dealing with the mischief caused by smoke and the great quantity of so-called ashes which the authorities of such a town as Liverpool had annually to remove, showed how both nuisances might be very considerably abated.

A discussion ensued and a vote of thanks having been passed to Mr. Carus, the proceedings terminated.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

A meeting of this Society was held on March 1, Dr. Gilbert, President, in the chair.

The following certificates were read for the first time:—J. A. Baxter, E. C. Hemming, J. B. Coleman.

The full list of Officers and Council was read from the chair. The changes contemplated are given in the report of the meeting on February 15; in that report the name of Professor Dittmar was, however, inserted instead of H. T. Brown, as a proposed member of the Council.

During the evening a ballot was held, and the Scrutators, Dr. Hodgkinson and Mr. Howard, declared the following gentlemen duly elected Fellows:—A. C. Abraham, G. Board, C. N. Betts, E. Bevan, F. J. Cox, A. Collenette, S. Dyson, W. T. Elliott, H. B. Fulton, C. G. Grenfell, B. F. Halford, W. D. Hogg, D. Hooper, J. J. Knight, H. F. Lowe, T. H. Leeming, J. E. Marsh, W. Newton, C. Rumble, F. Scudder, J. O'Sullivan, S. A. Vasey, T. D. Watson, R. M. Walmsley, C. S. S. Webster, F. Watts.

The following papers were read:—

On some Derivatives of the Isomeric $C_{10}H_{14}O_7$ Phenols. By H. E. Armstrong and E. H. Rennie.—Lallemand stated (*Ann. Chem. Ph.*, 101, 119) that by the action of a mixture of strong nitric and sulphuric acids on dinitrothymol a trinitrothymol was obtained. The authors have repeated this reaction and find that a trinitro body is produced, but that it is trinitrometacresol, the propyl group being displaced. The authors were unable to trace this reaction. On comparing carvacrol with thymol it is seen that the only difference is in the relative positions of the methyl and propyl groups. Only a dinitro derivative could be obtained from carvacrol; no trinitro body could be formed. An attempt was made to introduce the NO_2 group into the unoccupied ortho-position in thymol sulphonic acid, but without success, as the sulpho group is displaced by NO_2, and paranitrothymol is formed. When bromothymol sulphonic acid is oxidized by chromic acid a quinone is formed; with permanganate no formation of quinone takes place, but some amorphous, probably condensation products are produced. Dibromthymol with cold nitric acid forms a colourless substance, probably a nitroso body. The authors have also investigated the nitro bodies formed from isobutyl phenol.

Dr. Japp suggested that the propyl group which was displaced by NO_2 might be eliminated as propylen, which was then polymerized by sulphuric acid.

The Secretary then read a paper entitled—

Chemico-Microscopical Researches on the Cell-contents of Certain Plants. By A. B. GRIFFITHS.—The author has contrasted the growth of some savoy cabbages grown in a soil to which no iron was added with that of plants grown with the addition of ferrous sulphate. The weight of the latter plants was about twice that of the former, and the ash contained notable quantities of iron; in one case the stalk contained 3·521 per cent. Fe_2O_3 and the leaves 12·29 per cent. Fe_2O_3. Microscopical sections of the leaves exhibited minute crystals in some of the cells. On running potassium ferricyanide under the cover glass, these crystals became blue, and after the addition of barium chloride a cloudiness was observed; the crystals also were monoclinic, so the author concludes that they were crystals of $FeSO_4+7H_2O$.

The following communication was read by the Secretary:—

The Phenates of Amidobases. By R. S. DALE and C. SCHORLEMMER.—The authors could not isolate any compounds intermediate between aurin and pararosanilin, and have concluded, after many experiments, that when aurin is heated with aqueous or alcoholic ammonia, the action proceeds at once to the formation of rosanilin. When equal molecules of aurin and common rosanilin were heated with alcohol, a solution was soon formed and on concentration a crystalline powder, with dark-green lustre, separated, which proved to be rosanilin aurinate. Similarly, when equal molecules of anilin and phenol were heated for some hours to the boiling point, anilin phenate C_6H_7N,C_6H_6O was obtained in glistening plates, melting at 29·5°, boiling at 184·5°; this substance has a faint phenol-like odour. A rosanilin phenate has been prepared by Mr. G. Dyson. Red alkaline solutions of aurin sometimes turn brown. On acidifying such a brown solution a smeary mass is precipitated from which a body was isolated in colourless crystals; it proved to be dioxyphenylketone $CO(C_6H_4OH)_2$.

The Society then adjourned to March 15.

A meeting of this Society was held on March 15, Dr. Gilbert, President, in the chair.

The following certificates were read for the first time:—T. L. Briggs, E. C. Conrad, C. Gillett, L. Levy, A. Ness, V. S. Schopoff and A. E. Wilson.

Dr. Gilbert announced that the anniversary meeting would take place on Friday, March 30, and that he had decided, after much deliberation, to resign the office of President; the Council proposed that Dr. W. H. Perkin should fill the vacancy thus created, and that Mr. J. Millar Thomson should be Secretary.

Mr. MATTHEWS then read a paper—

On some Condensation Products of Aldehydes with Aceto-Acetic Ether, and with substituted Aceto-Acetic Ethers.—The author has studied the following reactions, condensations of acetic ether with isobutylic aldehydes, with valeric aldehyde, with chloral, with furfurol and with acrolein; benzoic aldehyde with acetodiethyl acetic ether, with acetodichloracetic ether, with acetobenzylidenacetic ether, and with acetomonoethylacetic ether. He concludes that acetoacetic ether is capable of condensing with aldehydes of all descriptions, and that the condensation takes place only in the methylene group, but with the greatest ease; that mono and disubstituted acetoacetic ethers, with the exception of the dichlor ether, are capable of condensing with benzoic aldehyde, but the condensation is very much more difficult to effect and it takes place only in the methyl group.

Mr. R. Warington communicated a paper entitled—

Contribution to the Chemistry of "Fairy Rings." By Sir J. B. LAWES, J. H. GILBERT and R. WARINGTON.—The circles of dark-green grass which frequently occur on pasture land, and which have been long known by the name of "fairy rings," have attracted much attention from botanists and vegetable physiologists. Professor Way, in 1846, explained this phenomenon as follows:—"A fungus is developed on a single spot of ground, sheds its seed and dies. On the spot where it grew it leaves a valuable manuring of phosphoric acid and alkalies, etc., the ground then becomes occupied by a vigorous crop of grass rising like a phœnix on the ashes of its predecessor; the grass crop is then removed and with it the greater part of the inorganic materials the fungus had collected." Professor Way, therefore, attributed the effect chiefly to the inorganic elements. Many experiments were made on the subject at Rothamsted, and in 1851 (*Journ. Royal Agricultural Society*, vol. xii., 32), it was stated that the manuring action was due to the nitrogen collected by the fungus rather than to the ash constituents. The source of the nitrogen was at that time supposed to be the atmosphere. Since that time, however, much evidence has been acquired as to the sources of the nitrogen of green-leaved plants, and grave doubts have arisen as to the nitrogen being derived from the atmosphere. In 1874 an attempt was made to obtain direct experimental data on the subject. Samples of soil were taken, of the soil inside a fairy ring, from the ring and outside. The quantity of organic carbon and nitrogen was carefully estimated; the mean results obtained were nitrogen within the ring 0·247 per cent., on the ring 0·266 per cent., outside 0·281 per cent.; carbon within 2·78 per cent., on the ring 2·99 per cent., outside 3·30 per cent. The percentage of nitrogen and carbon is therefore highest in the soil outside the ring and lowest within the ring, whilst the quantities found in the soil from the ring have an intermediate value. It is obvious, therefore, that the growth of the fungus and the subsequent increased growth and removal of the associated herbage are accompanied by a considerable reduction in the amount of the organic carbon and nitrogen in the soil, and that fungi have taken up organic carbon and nitrogen from the soil which was not available to the previously established vegetation. Five series of experiments were made and the investigation would have been continued, but owing probably to the late wet seasons the fairy rings have disappeared from Rothamsted. The soil of the ring always contained more nitrates than the soil either within or without.

Dr. Gilbert said that the point of interest in the paper was the source of the nitrogen. These rings usually occurred on very poor pastures, and it was at first natural to suppose that the fungi must draw the nitrogen from another source, as the previous vegetation could not obtain it from the soil, and although we have no evidence that green-leaved plants can obtain nitrogen from the atmosphere it was thought that with fungi, of which the growth is so different, it might be otherwise. Direct evidence that the nitrogen comes from the soil is still wanting, but there is a great deal less evidence that the nitrogen is furnished by the atmosphere, so that on the whole the balance of evidence points to the soil as the source of the nitrogen.

The Secretary then read a paper—

On Lines of no Chemical Change. By E. J. MILLS and W. Mc. D. MACKEY.—The authors considered it of great interest to determine in certain cases the origin of chemical change, such origin being obviously identifiable in many instances with a line of no chemical change. In the present paper they have studied the reaction between sulphuric acid and zinc brought into contact under definite conditions as regards temperature, strength of acid, etc. The hydrogen evolved was taken as the index of the extent of the reaction. The results are represented in tables, and are plotted on a curve. The nature of the reaction is shown to be of a very complicated character. The law of the relation of temperature to chemical change requires an equation of the second degree. The authors state that their investigations place temperature on the footing of an ordinary chemical reagent. They intend to resume this investigation.

The Secretary then read a paper—

On Homologous Spectra. By W. N. HARTLEY.—In June, 1881, the author published (*Chem. Soc. Journ.*, 134

84) a note on certain photographs of the ultra-violet spectra of elementary bodies, and attention was directed to the extraordinary similarity between the groupings of lines in the spectra of magnesium, zinc and cadmium, copper and silver, iron, cobalt and nickel. It was thus made evident that the spectra of elements of the same homologous series present either homologous spectra or homologous groups of lines in their spectra; but it was remarked "it will be hopeless to determine whether there are numerical relations between the wave lengths of different groups of lines until the spectra have been reproduced on an enlarged scale, and the wave lengths for the principal lines of the different elements calculated." Ciamician has remarked that almost every element has a number of feeble lines which bear the same relation to the chief line or lines that the overtones in music bear to the fundamental note. These observations, however, refer only to the visible rays or about one octave of the spectrum; photographs of the ultra-violet region can easily be extended to more than two octaves. The conclusions of Ciamician are completely confirmed by such extended photographs. The three hydrogen lines N, F and C have been shown to be the thirty-second, twenty-seventh and twentieth harmonies of a fundamental vibration whose wave length is 0·01313 mm. There is evidently a harmonic relation between the lines in the spectra of magnesium, zinc, cadmium, aluminium and in those of calcium, strontium and barium when two octaves of the spectra are examined. The fundamental vibrations appear to be all in the infra-red region. The author originally intended to bring forward an extended series of observations on the constitution of the spectra of the elements, but as it appears that Liveing and Dewar are engaged in a similar research, the author wishes to publish such facts as he has already obtained. In order that harmonic relations between lines and groups of lines may be rendered apparent it is necessary to map spectra according to their "oscillation frequencies," instead of wave lengths. The author has thus mapped the wave frequencies in one millimetre of the chief rays in the spectra of magnesium, zinc, cadmium, copper, silver, silicon, boron and aluminium. The data thus obtained present a considerable addition to the body of evidence in support of the view that elements whose atomic weights differ by a constant quantity and whose chemical character is similar are truly homologues, or in other words are the same kind of matter in different states of condensation. The probability of the fundamental vibrations of the simpler elements being found in the infra-red region will doubtless be soon tested, since Captain Abney has enabled us to photograph this region, and with the help of Rowland's exquisite concave ruled specula, etc., has now a range of four octaves of the spectrum.

The Society then adjourned to April 5, when a paper, "On the Estimation of Hydrogen Sulphide and Carbonic Anhydride in Coal Gas," by L. T. Wright, will be read. The anniversary meeting is on Friday, March 30.

ROYAL INSTITUTION.

The Primæval Ancestors of Existing Vegetation and their Bearing on the Doctrine of Evolution.

BY PROFESSOR C. W. WILLIAMSON.

The fifth lecture of this course was delivered on Tuesday, February 6. The following is an abstract :—

The Cellular Cryptogams, as their name implies, are wholly devoid of fibro-vascular bundles, though in some forms, as in some seaweeds, the fronds appear to have a district midrib which, on a superficial glance, might be supposed to be a vascular bundle, but more minute examination shows to be merely composed of one or more linear series of elongated, square-ended cells. The most highly differentiated of these cryptogams are probably the mosses of which the spores develop a branching creeping Prothallus, called the Protonema, that gives off root hairs, and seeds that develop into the aerial shoots. Some of these latter bear the sexual reproductive organs in the shape of Antheridia and Archegonia; the entire vegetative organism may be regarded as a Prothallus. The Anatheridia and Archegonia are sometimes found on the same and sometimes on different plants; functionally these organs correspond with those seen on the vascular cryptogams. The fertilized cell occupying the base of the Archegonium develops into a Sporogonium or spore-bearing structure. The most important part in this structure, which consists of several parts, is the Theca or urn; a hollow capsule, supported on a slender stalk, within which the spores are found and from which they are liberated, when ripe, by the detachment of a small lid, or aperculum. Though this sporogonium remains attached to the vegetative portions of the moss, it nevertheless represents a distinct generation; since, though supported by the leaf-bearing Prothallus, it has no true organic connection with it. Hence, even in these mosses we have a distinct alteration of generation, a sexual, followed by a non-sexual one.

Though at the present day mosses are so numerous and widely distributed over the earth, from the Tropics to the Artic circle and from the Equatorial sea-level to the snow-line of our mountain ranges, we find no traces of them in a fossil state in rocks older than the Tertiary strata. That they are capable of fossilization is shown by the circumstance that a considerable number of such have been preserved in these more recent beds and in the amber met with in many localities. But no trace of an indisputable moss has been met with in the Cretaceous or more ancient strata,—a remarkable fact suggesting a modern origin of the entire group. These remarks apply equally to the nearly allied group of the Jungermanniæ. Many of these have a very moss-like habit, but differ chiefly from the mosses in the characteristic features of their Sporogonia, of which the organization is much simpler than is the case with those of the mosses. They are yet further distinguished by the mechanism by which the spore-containing capsule is burst open to liberate the spores. This capsule is only partially filled with spores, which have intermingled with them a number of cells, each of which contains a spiral thread. Non-elastic so long as not ripe, when it becomes so it is highly elastic; reaching this state it expands the cell in which it is contained, all acting more or less simultaneously. These "Elaters" burst the capsule, separating it into four valves, and thus setting the spores free. In the lower true Jungermanniæ and the Marchantiæ, or Liver-worts, the vegetative structure is less moss-like, and assumes much of the appearance of a gigantic fern—Prothallus; the resemblance being made the more obvious by the fact that this Prothalloid organism bears the Antheridia and Archegonia, from the latter of which are developed sporangia containing spores, and which represent a simple form of sporogonial generation. These Jungermanniæ and Marchantiæ also occur in a fossil state in the Tertiary rocks. The Characeæ constitutes another highly distinct group of cellular plants of aquatic habits, remarkable for the large size of their elongated cells. Here, again, we find Antheridia and Archegonia assuming very distinctive forms, these being severally known by the names of *Globule* and *Nucule*. The latter, also known as the Carpogonium, is the female organism, and is readily distinguished by five broad and distinct bands wound spirally around the central cavity containing the spore. These carpogonia, the fossil states of which have long been known as Gyrogonites, are found abundantly, not only in the Tertiary strata of Fresh-water origin, but also in the Cretaceous and Oolitic rocks, and, according to Schimper, they have also been discovered near Moscow in the bed of Triassic age, known as the Keuper. Hence these plants have evidently not only existed at an early period of the world's history, but have undergone but little

change between what seems to have been the age in which they originated and the present time.

There can be no doubt but that some forms of marine vegetation must have existed at least as far back as the period when animal life first made its appearance on the earth; since plants alone have the power of converting mineral matter into an organic form, and the earliest animals must have required pre-existing vegetable matter on which to subsist. But the identification of these Protophytes is not easy. Myriads of objects exist in a fossil state, which have been called "Fucoids"; but many of these have been portions of plants of higher organization, all details of which have disappeared. Some of these have been identified as belonging even to the Conifers; others to Ferns, etc. Then, again, M. Natharst, of Stockholm, has shown that many supposed marine plants are merely casts of the tracks left by marine animals when crawling over a muddy sea-bottom. There is, however, no question respecting the *Fucoid* character of many forms existing in the Tertiary and Oolitic strata, whilst resemblances of form suggest that yet older and less distinct objects may have been of the same nature. But in most cases proofs that such has been the case are unattainable; hence these objects cannot be relied upon in framing a genealogical tree of vegetable life. On the other hand the group of Fungi is represented in strata of various ages, and very distinctly so in some of the older Carboniferous rocks. The latter consist wholly of some of those lower Fungoid forms known as moulds, five examples of which have been found in the Lower Coal Measures of Halifax, in Yorkshire.

Having thus, in this course of lectures, reviewed some of the more distinctive types of vegetable life found in the Palæozoic rocks, and endeavoured to trace the links connecting these ancient types with their living representatives, we may ask, how far does the order of their succession correspond with what the doctrine of Evolution would presuppose to be probable.

If we examine the living plants only, we have no difficulty in following a succession of graduated forms which might well suggest a continuous line of descent from the simplest to the most highly organized types of Plant-life; but such would not necessarily be the actual ancestral line. We have seen how long the Cryptogams and Gymnosperms existed before any of the Angiosperms or higher flowering plants made their appearance. Dealing with special types, we have seen that the lowly organized Hymenophylloid Ferns were amongst the earliest of which traces have been discovered. In the same way the most ancient cone-bearing plants, as the Cycads and Conifers, but especially the latter, only assumed their modern characteristics by slow degrees and after long periods of time; yet testing these Gymnosperms by their flowers we see that the most ancient ones belonged to the least complex of known groups, whilst the higher types came into existence during more recent times. On the other hand the most ancient Lycopods and Equisetums burst upon us in the Devonian age, almost, if not absolutely, in the state of their most glorious culmination whether of size or organization. They did so in contemporary association with Conifers (Dadoxylons), which occupy a high rank even compared with the vascular Cryptograms along with which they grew; how much higher therefore are they than the simple unicellular specks of Protoplasm from which we assume them all to have primarily originated. It is obvious from these and numerous similar facts that whilst the study of fossil plants gives a general support to the Doctrine of Evolution, that support does not and cannot at present extend beyond a limited measure. There must have been a protracted duration of time antecedent to that of the Devonian rocks, during which vegetation developed from its lowest and simplest state to that of the noblest Dadoxylons, Lepidodendra, Calamites and Tree ferns which existed in the Devonian and Carboniferous ages. Of that Predevonian vegetation we have yet obtained but the faintest glimpses. We can only hope that ere long more will be discovered, but until such discoveries are made all attempts to frame a genealogical tree of the vegetable world must be useless and vain.

CHEMISTS' ASSISTANTS' ASSOCIATION.

At a meeting of the Association held on Wednesday, March 14, Mr. W. A. Wrenn in the chair, a paper on "Porcelain, its Manufacture and Composition," was read by Mr. H. Cracknell.

Mr. Cracknell first alluded to the antiquity of the potter's art. He mentioned that the Portuguese were the first to import Chinese porcelain into Europe about 1518, but it was not for more than two hundred years after that soft porcelain was manufactured in France. He then alluded to Böttcher as being one of the first to investigate the subject of porcelain manufacture. Next he pointed out the difficulties met with in early days, due principally to the want of a knowledge of chemical analysis and mineralogy. The author then proceeded to describe the difference between hard and soft porcelain, and the glazes used for them, and gave a short account of the manufacture of true hard porcelain, Sèvres porcelain and Viennese porcelain. Lastly he gave a detailed account of the manufacture of porcelain at Worcester, dealing especially with fine porcelain, mentioning the grinding of the materials, and the kneading and beating required to make the paste tough; after which he proceeded to describe the potter's wheel and its use. The process of firing and glazing having been fully dealt with, an account was given of painting and gilding on porcelain, mentioning the salts used for the colours and also describing the preparation of the gold for the workmen. He then mentioned a few of the marks which appear on Worcester porcelain, but he cautioned those who might be collectors not to be led astray, inasmuch as marks which were considered valuable and much sought after were freely manufactured both at home and abroad. The paper was illustrated with diagrams, and tables of the composition of the various clays used in the manufacture of porcelain, as well as of the composition of the various glazes, were also shown.

A discussion took place in which the President, Messrs Alcock, Cooper, Millhouse and Woods took part.

Obituary.

Notice has been received of the death of the following:—

On the 31st of January, Mr. Charles Farrant Webber, Chemist and Druggist, Market Place, Sidmouth. Aged 41 years.

On the 4th of February, Mr. William Bray, Chemist and Druggist, Buntingford, Herts. Aged 55 years.

On the 17th of February, Mr. Paris Anderson Huggard, Chemist and Druggist, Church Street, Alpha Road, London. Aged 73 years.

On the 22nd of February, at Bishop's Castle, Shropshire, Mr. Albert Brown Hollway, Chemist and Druggist, Aged 44 years. Mr. Hollway had been an Associate in Business of the Pharmaceutical Society since 1869, and was formerly Local Secretary for Cardiff.

On the 25th of February, Mr. Lewis Michael Wibmer, Pharmaceutical Chemist, Tunbridge. Aged 70 years. Mr. Wibmer had been a Member of the Pharmaceutical Society since 1853.

On the 28th of February, Mr. Charles Edmund Hitchcock, Pharmaceutical Chemist, High Street, Oxford. Aged 66 years. Mr. Hitchcock had been a Member of the Pharmaceutical Society since 1842.

On the 1st of March, Mr. Matthew Pound, Pharmaceutical Chemist, Leather Lane, London. Aged 71

years. Mr. Pound was one of the Founders of the Pharmaceutical Society.

On the 3rd of March, Mr. William Field, Pharmaceutical Chemist, Brompton Road, London. Aged 82 years. Mr. Field also was one of the Founders of the Pharmacentical Society.

On the 3rd of March, Mr. Henry Woodhead Hewitt, Chemist and Druggist, Wood Bank, Sheffield. Aged 65 years.

On the 3rd of March, Mr. George Godden, Chemist and Druggist, Plumstead. Aged 87 years.

On the 6th of March, Mr, John Woodman Bowring, Pharmaceutical Chemist, Ringwood, Hants. Aged 63 years. Mr. Bowring was one of the Founders of the Pharmaceutical Society.

On the 9th of March, at Glasgow, Mr. William Hatrick, Pharmaceutical Chemist, Gilmour Street, Paisley. Mr. Hatrick had been a Member of the Pharmaceutical Society since 1853, and at the time of his death was Local Secretary for Paisley.

On the 12th of March, Mr. John Davies, Chemist and Druggist, Pontypridd. Aged 44 years.

On the 13th of March, Mr. George Jarman, Chemist and Druggist, Bolton Street, Bury, Lancs. Aged 76 years.

On the 16th of March, Mr. Joshua Henthorn, Pharmaceutical Chemist, Lees Road, Oldham. Aged 57 years. Mr. Henthorn had been a Member of the Pharmaceutical Society since 1853.

BOOKS RECEIVED.

PHYSICAL OPTICS. By R. T. GLAZEBROOK, M.A., F.R.S. London: Longmans, Green and Co. 1883. [Text-Books of Science.] From the Publishers.

THE INTERMEDIATE TEXT-BOOK OF PHYSICAL SCIENCE. By F. H. BOWMAN, D.Sc., etc. London: Cassell, Petter, Galpin and Co. 1882. From the Publishers.

PHOTOMETRY and GAS ANALYSIS. Compiled and Edited by J. T. BROWN, F.C.S. London: The Scientific Publishing Company. From the Publishers.

A PHARMACOPŒIA OF SELECTED REMEDIES, with Therapeutic Annotations. By EDMUND A. KIRBY, M.D., etc. Sixth Edition. London: H. K. Lewis. 1883. From the Author.

SYLLABUS OF MATERIA MEDICA for the Use of Students, Teachers and Practitioners. By ALEXANDER HARVEY, M.D., and ALEXANDER DYCE DAVIDSON, M.D. Sixth Edition. London: H. K. Lewis. 1882. From the Publisher.

ST. BARTHOLOMEW'S HOSPITAL REPORTS. Edited by W. S. CHURCH, M.D., and JOHN LANGTON, F.R.C.S. Vol. XVIII. London: Smith, Elder and Co. 1882.

THE PHILOSOPHY OF ADVERTISING AND NEWSPAPER REGISTER. By HENRY SELL. London: H. Sell. 1883.

DENTAL VADE MECUM. Concise Notes on Anatomy, Physiology, Surgery and Chemistry. Fourth Edition. By JAMES HARDIE. Glasgow: W. Collins and Co. 1882. From the Author.

Sid Evans.—Such an appointment would be outside the scope of the Bill.

A. J. W.—See the Preface to the British Pharmacopœia, p. xiii.

Botanist.—The Editor of the *Journal of Botany* is Mr. James Britten, 3, Gumley Row, Isleworth.

Major.—The circumstance you mention has not been overlooked, and on reference to the terms of the clause in question, you will find that they are not by any means one-sided. The consideration of the claims of existing managers may well be deferred until the occasion for it is more pressing.

A.P.S.—An answer to your question was given on p. 660, under the initials *F.S.S.* An examination of the compound there referred to would probably well repay the trouble.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

THE FERTILIZATION OF THE PAPAVERACEÆ.

Sir,—When reading over the order Papaveraceæ I came across a statement that some inquisitive botanist had amused himself in counting the number of seeds contained in the capsule of a poppy, viz., 32,000. A question occurred to me at the time, I having been previously reading the subject of "Fertilization." A pollen grain falling on the apex of the ovary (stigma) forms a long tube which penetrates the style when present, enters through the micropyle to the oosphere, which is in consequence fertilized. Now the question is, "Does it require a pollen grain for each of the seeds produced?" If so, no less than 32,000 pollen grains would have to fall on the stigmas of one poppy, and the same number of tubes to penetrate the ovary. If not, then each pollen grain can form more than one embryo and be the father of many plants. From analogy we find that it requires in mammalia a spermatozoa for the fertilization of each ovum; if two enter the same ovum and each thrives, then a monster is the product, and it is impossible for one spermatozoa to enter more than one ovum. Will some reader kindly throw light on it, giving quotation of authors. If not explained anywhere I think it is a worthy subject for investigation.

MORRIS J. WILLIAMS.

St. Bartholomew's Hospital, E.C.

AROMATIC SPIRIT OF AMMONIA.

Sir,—In reply to Dr. Thresh and Mr. Tanner (pp. 700 and 776 of this volume), allow me to refute the error imputed to me and to quote Dr. Thresh again:—"Taking the official quantities, the ammoniæ carbonas refuses to dissolve in the requisite amount of water and solution of ammonia without the aid of heat." The plain English of the requisite amount of water, I take to be the quantity required to make the preparation. Dr. Thresh now says, he means the quantity contained in the finished product. I respectfully submit the above quotation will not bear this construction, although Mr. Tanner goes further than I did, and says, that a solution can be made in the cold even with this quantity of water, which is one-sixth the requisite amount of the B.P. process.

10, *New Cavendish Street, London, W.* WM. MARTINDALE.

[*** As it is evident that our correspondents hold distinctly different opinions as to what should be understood as the meaning of the words "requisite amount of water," it will serve no useful purpose to continue the correspondence.—ED. PH. JOURN.]

T. Evans.—Godfrey's 'Diseases of the Hair' (Churchills).

W. D. Haydon.—We have received your circular, but cannot perceive that it contains anything of sufficient interest to call for its publication.

Country Major.—You appear to have overlooked the fact that the recommendation you suggest has been submitted and has met with a distinct refusal. We do not think that further recommendations of the same nature are likely to meet with a satisfactory reception.

Wanting Help (who should have sent his name and address).—We think enough has been said for the present upon the subject of "golden ointment."

Novice.—No special qualification is necessary. See a communication on "Pharmacy in South Africa" in the *Pharm. Journal* for July 2, 1881, p. 19.

T. D.—The case you refer to is provided for in the Bill.

Troubadour.—Your letter has been received, but the immunity spoken of is certainly not in accord with our own experience.

COMMUNICATIONS, LETTERS, etc., have been received from Dr. Mallez, Messrs. Illingworth, Brown, Long, J. O. Smith, Storey, Evans, R. H., Veritas Vincit, Outon.

MACKEYS' QUINQUININE.—An improved Preparation containing the pure Alkaloids of the Officinal Cinchona Barks, in many respects superior to the Sulphate of Quinine, at about half the present price of Quinine. Has been largely used in Hospital and Private practice with the greatest satisfaction. Messrs. MACKEY are continually receiving testimonials as to the efficacy of MACKEYS' QUINQUININE and the advantages it possesses over Quinine. A few extracts are subjoined. "Dorchester, 3rd Dec. 1882.—I use Mackeys' Quinquinine constantly in place of Quinine, and find it preferable in many instances.—W. B. KENDALL, L.R.C.P." "Sandwich, Kent.—Therapeutically Mackeys' Quinquinine equals Sulphate of Quinine. It is a certain tonic in direct debility, and a sheet-anchor in all cases where fever remits or intermits. Personally, I have derived most marked and rapid relief from its use, in repeated attacks of lumbago, to which I am very subject. I take two grains every four hours, dissolved by the aid of Citric Acid, which is a combination I can strongly recommend.—THOS. HORNE, L.R.C.P." Mr. F. OLDFIELD writes from Bloemfontein, S. Africa:—"Please send me Mackeys' Quinquinine, it suits here much better than Quinine." N.B.—ONLY THAT BEARING OUR NAME IS GENUINE.

MISTURA CERII COMP. (Protected by Royal Letters Patent.)—This elegant Preparation has been found of great value in Chronic Intestinal Eruption. In Irritable Dyspepsia, attended with Gastrodynia, Pyrosis, and General Chronic Vomiting, it has been extensively prescribed by the leading Physicians.

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A STEADY married man. No family. Accustomed to a general Retail and Prescribing business. Must be able to Extract Teeth, and take occasional management. House and gas free. State age, salary, &c., expected, and reference from last situation, to WM. STEVENS, Chemist, Chatham. Letters unanswered within 7 days declined.

AT once.—In the office of a firm of Wholesale Druggists an INVOICE CLERK. Must be thoroughly accustomed to the work, a good and quick writer, and must furnish satisfactory references. Apply, LOFTHOUSE & SALTMER, Wholesale Druggists, Hull.

IMMEDIATELY.—A well educated gentlemanly youth as APPRENTICE. Comfortable home and every facility afforded for acquiring a thorough knowledge of the business. Apply to T. H. VAUGHAN MORRIS, Chemist, Hereford.

A COMPETENT ASSISTANT. Salary to commence 30*s.* per week. Send full particulars and photograph, to be returned, FRESSON, Chemist, Hanley, Staffordshire.

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ASSISTANTS WANTED.

A COMPETENT and trustworthy Assistant, with a knowledge of Homœopathic Pharmacy, to take charge of Branch. No Sunday duty. Apply, stating all usual particulars, to W. T. G., 66, High St., Putney, S.W.

A GENTLEMANLY Assistant, well up in Dispensing. Salary £50 per annum. Apply personally, if possible, if by letter enclose carte de visite, to be returned, to Messrs. Cooper & Co., Pharmaceutical Chemists, 80, Gloucester Rd., South Kensington, S.W.

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AN Assistant. By the second week in April. Accustomed to Dispensing and good class Retail. Apply, with usual particulars and salary required, to J. Shemmonds, Bournemouth.

BUSINESSES FOR DISPOSAL.

IN Chancery.—Chemist's and Druggist's Businesses.—Messrs. Hudson Smith, Williams & Co. are instructed to offer for sale by private treaty the Businesses lately carried on by Mr. John Facey, Chemist and Druggist, deceased, at White Ladies Rd., Clifton, and at Woodwell Crescent, Bristol. Tenders will be received by the Brokers at their offices, Exchange, Bristol, until Saturday, the 31st inst. Particulars and orders to view may be obtained from them or from Messrs. Benson & Carpenter, Solicitors, Corn St., Bristol.

Dated, Exchange, Bristol, 14th March, 1883.

TO Chemists, Perfumers, &c.—276, Oxford St. (late one of the Dispensing Branches of the General Apothecaries' Company).—Messrs. Elliott, Son & Boyton are instructed by the proprietor (who has disposed of his lease to the National Bank, Limited, as a branch for their Oxford St. business) to Sell by Auction, unless previously disposed of by private contract, on the premises, on Tuesday, April 3, 1883, at 1 o'clock precisely, the valuable Fixtures, Fittings, and Stock-in-Trade, comprising handsome Spanish mahogany counters, dispensing screen, showcases, wall fittings and window enclosures, stock of drugs, patent medicines and perfumery, stock bottles and their contents, swan-neck shaped show globes, ornamental specie jars, and a quantity of miscellaneous items composing the stock of a high class chemist. On view Monday, April 2. Catalogues of the Auctioneers, at their offices, 5, Vere St., W.

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London: Printed by WILLIAM INGLIS RICHARDSON, 4 and 5, Great Queen Street, Lincoln's Inn Fields, and Published by Messrs. J and A. CHURCHILL, 11, New Burlington Street.

The Pharmaceutical Journal AND Transactions.

THIRD SERIES, No. 666.] SATURDAY, MARCH 31, 1883. [PRICE FOURPENCE.

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Pharmaceutical Society of Great Britain,

17, BLOOMSBURY SQUARE, LONDON.

ELIAS BREMRIDGE, Secretary and Registrar.

NOTICES.

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Cheques and Post Office Orders should be made payable to the Secretary, and crossed "London and Westminster Bank."

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There are at present *thirty-nine* annuitants, receiving £1295 per annum, and casual relief is also granted, involving a total annual expenditure of about £1800.

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And to increase in the same proportion.	
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And to increase in the same proportion.	

Donations or Subscriptions are earnestly solicited.

Cheques and post office orders to be made payable to ELIAS BREMRIDGE.

EVENING MEETING.

The next EVENING MEETING will be held on Wednesday, April 4th, 1883, at Eight o'clock.

The Chair will be taken at half-past Eight *precisely*.

The following papers will be read:—

"The bitter principle of Hymenodictyon Excelsum." By W. A. H. NAYLOR.

"Remarks on Medicinal Plants of Ceylon." By W. C. ONDAATJE, F.L.S., Colonial Surgeon of Ceylon.

A complete series of the barks of the Cinchonas cultivated in the Indian plantation at Ootacamund, including Herbarium specimens of the same, has been received from the Indian Government, and will be exhibited at this meeting.

MAJOR, MINOR AND MODIFIED EXAMINATIONS.

The Board of Examiners for England and Wales meets at 17, Bloomsbury Square, London, in February, April, June, July, October, and December, and the Board of Examiners for Scotland meets at 119A, George Street, Edinburgh, in January, April, July, and October, for the purpose of conducting the above Examinations. Candidates must give notice to the Registrar in London, and pay the fee on or before the *first* day of the month in which the Examinations are held. Each candidate for the Major and Minor Examinations must, at the time of giving notice, produce a Registrar's Certificate of Birth, and a certified declaration that for three years he has been registered and employed as an Apprentice or Student, or has otherwise for three years been practically engaged in the translating a l dispensing of prescriptions. Printed forms of declar on may be obtained from the Registrar in London. Each Candidate for the Modified Examination must state the number of the receipt for his declaration and his age at the time of giving notice.

Candidates will receive notice of the date on which they will be required to present themselves.

In the practical portion of the Major Examination standard works of reference are provided for the use of Candidates at the discretion of the Examiner. No other books or memoranda are allowed.

SPECIAL NOTE.

Each Candidate must state, at the time of giving notice, whether he desires to be examined in London or in Edinburgh.

Price 5s., or post free, 5s. 7d.

THE REGISTER
OF PHARMACEUTICAL CHEMISTS AND CHEMISTS AND DRUGGISTS
FOR 1883.

Published pursuant to the "Pharmacy Act, 1868."

SINCE the last issue, the Register has undergone a complete revision, the Registrar having availed himself of the provisions set forth in the 10*th Section of the Pharmacy Act,* 1868, *to remove from the Register the names of all persons whom two registered letters, sent at an interval of six months, had failed to reach. Upwards of* **Two Hundred and Fifty** *names have thus been removed, and a large number of corrections have been made in the addresses of other persons.*

Copies will be supplied by the REGISTRAR, 17, Bloomsbury Square, London, W.C.

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OF THE
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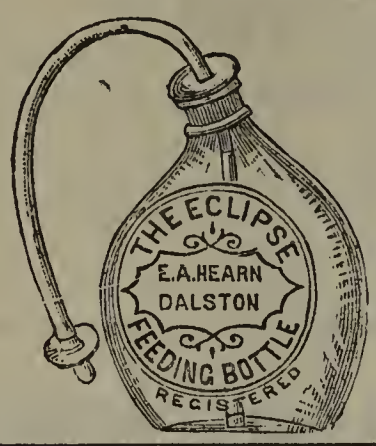

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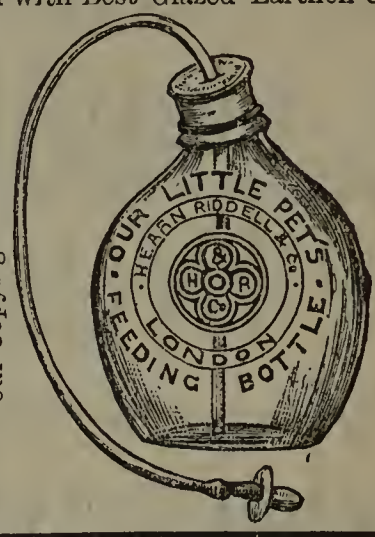

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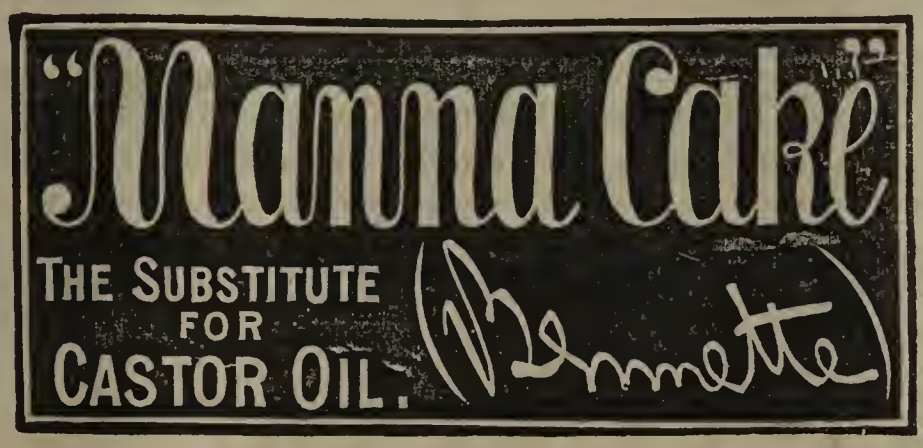

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"THE MONTH."

The cold blustering north-east winds have not been without their effect on vegetation, the season, in spite of the sunshine, being more backward than last year. Even in the sunny South, icicles two feet long were observed on Good Friday in the Isle of Wight, although in warm nooks the *Arum maculatum* and *Sarothamnus Scoparius* were met with in flower, and in sheltered spots, the cherry laurel, *Prunus Lauro-Cerasus*, and the true laurel of the ancients, *Laurus nobilis*, were seen covered with bursting flower-buds. The pretty little *Corydalis claviculata* and *Adoxa moschatellina* were observed in blossom, but the *Oxalis Acetosella* had not opened its delicate pencilled and pensile flowers. In cottage gardens the rosemary is coming into blossom, and on chalk downs the Pasque flower, *Anemone Pulsatilla*, is raising its dull bluish bells among the short grass. The yew, the elm, the dandelion and scurvy grass may be found in bloom in the country, and the almond will soon be in full beauty in the London gardens. Several rare British plants also flower at this time of year. *Trichonema columnæ*, at Dawlish Warren, and *Knappia agrostidea*, near Llyn Coron, in Anglesea, are probably often missed by botanists through flowering so early. *Carex ericetorum*, *C. clandestina* and *Lathræa squamaria* may also usually be found in blossom about Eastertide.

According to the *Gardeners' Chronicle* (March 3, p. 282), the cultivation of the rose-leaf geranium (*Pelargonium capitatum*) has been attempted in this country, and it is said with some success. From plants grown in the open air an essential oil has been obtained, which has been reported equal, if not superior, to the oils imported into this country under the name of geranium oils. It is said that with proper care plants, grown at the rate of about 3000 to an acre, will yield sufficient oil during their free growth in the summer, so that, after cuttings are taken (in September), the ground can be utilized with vegetables or other profitable crops. The statements, however, that rose-leaf geranium is grown to a large extent in Turkey is open to question, as is also the remark that oil of genuine rose-leaf geranium fetches about 3*s.* per ounce, while that of andropogon, with which it is often adulterated, is not worth more than that sum per pound.

At a meeting of the Edinburgh Botanical Society on February 8, Professor Dickson called attention to a donation to the Museum of the Royal Botanical Gardens of a foxglove, 10 feet high, and of another from the Bridge of Allan, 8 feet 1 inch high. A branch of the *Eucalyptus globulus* grown in a cool conservatory at Carlowrie, Linlithgowshire, was also shown, taken from a tree which grew at the rate of 4 feet in a year, being now nine years old (*Gardeners' Chronicle*, Feb. 26, p. 255).

The pretty yellow fungus, *Æthalium septicum*, commonly called flowers of tan, and which sometimes does much mischief where that substance is used in propagating houses, has been analysed by M. Bergmann and found to contain acetic and formic acids (*Gard. Chron.*, March 7, p. 344). This fact suggests the possibility that the fungus might be utilized as a ferment in promoting certain chemical changes.

Messrs. Dehérain and Breal, following up the researches of M. Bœhm, have ascertained that the presence of lime is beneficial in germinating seeds, and particularly when combined with ulmic acid (*Gard. Chron.*, March 7, p. 344), especially as regards the development of the root.

In the *Répertoire de Pharmacie* (p. 112), M. Stanislas Martin gives an account of the seeds of *Dolichos urens*, commonly known as the ass's eye bean, which is used in medicine in Tropical America in the form of a decoction, to alleviate the pain of hæmorrhoids; the pulp of the seed being employed as a topical application for cleansing and healing wounds. M. Martin found the seed to contain tannin, fixed and volatile oils, and mucilage like that of *Plantago Psyllium* and a brown extractive matter. He attributes the effect of the drug to the tannin and mucilage, the former of which is present in considerable quantity. As, however, the bean is used as a diuretic in the West Indies it seems probable that it may contain some other active principle.

Dr. J. M. Gibbs, New Zealand, recommends (*Lancet*, February 24, p. 316) the use in diphtheria of an inhalation of steam impregnated with *Eucalyptus globulus*. In thirty-seven cases, in which the treatment was carried out, the patients recovered without a bad symptom. He found it especially useful in those cases in which the larynx was affected and where the patches in consequence could only be reached by steam. In influenza and laryngeal phthisis it was found equally useful. His mode of procedure is to pour boiling water on blue gum leaves and change the infusion every half hour. The leaves as procurable in this country would doubtless be less rich in volatile oil and the substitution of the oil would therefore be likely to prove more generally useful.

In the *British Medical Journal* (March 10, p. 449) Dr. Marion Sims gives an interesting account of the permanent cure of syphilis by the native Indians, the chief agent in the remedy being *Stillingia sylvatica*. The formula recommended is:—Fl. ext. *Smilax sarsaparilla*; fl. ext. *Lappa minor*; fl. ext. *Phytolacca decandra*, āā ℥ij; tincture of *Xanthoxylon Carolinianum*, ℥j; M. Take a teaspoonful three times a day before meals and gradually increase the quantity to a tablespoonful. The *Stillingia* root is said to lose much of its activity when kept for a long time.

In the *Medical Record* (Feb. 3, 1883) Dr. C. J. Macguire states that he has found subnitrate of bismuth very valuable in cancrum oris, curing the disease in twenty out of twenty-four cases. The powder was topically applied every three hours, after cleansing the mouth with a disinfecting solution.

Dr. E. A. Whiteley, of Duffield, points out (*Lancet*, March 10, p. 437) that the external application of salicylate of soda affords speedy relief when applied to painful joints in cases of acute rheumatism. The strength of solution used is 20 grains to the ounce of water.

As the result of an experimental investigation into the action of opium, chloral and bromide of potassium, Drs. Ringer and Sainsbury (*Brit. Med. Journ.*, March 24, p. 556) express the opinion that a salt now used rather extensively in America, viz., bromide of sodium, might probably be substituted with advantage for the last two, the salts of potassium being about ten times as poisonous as those of sodium, with regard to their action on the heart, and the bromide of sodium ranking far ahead of bromide of potassium, chloral or opium, as to innocuousness.

A substance called ichthyol, obtained by R. Schroter, by the distillation of bituminous substances and treatment with concentrated sulphuric acid, has been recently experimented with by Dr. P. G. Unna, of Hamburg. It is tarlike in appearance and has a peculiar and disagreeable odour, but does not resemble any known wood or coal tar in its chemical and physical properties. In consistence it resembles vaseline, and its emulsion with water is easily washed off the skin, whilst it may be mixed in any proportions with lard, oil or vaseline. Ichthyol is said to contain about 10 per cent. of sulphur and a small quantity of phosphorus, as well as carbon, hydrogen and oxygen, the sulphur, however, being in a state of combination which is not decomposed by preparations of lead and mercury. It is alleged to soothe pain and itching, and is considered a fairly good remedy in psoriasis and acne, and is useful as a parasiticide. In eczema it has been used with great benefit, the plan found most successful being to begin with a moderately strong preparation, or to reduce the strength gradually. For moist eczema 20 to 30 per cent. preparations reduced to 10 per cent., and for the papular condition 50 per cent. reduced to 20 per cent., are used. For obstinate eczema of the hand, the following formula has been found very efficacious:—Litharge, 10 parts, boiled with 30 parts of vinegar, to 20 parts; olive oil or lard, 10 parts; ichthyol, 10 parts. Any strength from a 5 per cent. to a 40 or 50 per cent. preparation may be used with safety undiluted. A stronger application may be used to the hands than to the face and stronger for children than adults.

At a meeting of the Medical Society of London on March 12 (*Lancet*, March 24, p. 500), a case of poisoning by citrate of caffeine was mentioned by Dr. Routh, in which the drug had been prescribed in drachm doses three times a day for the relief of severe headache in a man under treatment for debility. The report states that Bishop's effervescing preparation was intended, but the pure salt was sent. The difference in dose of an effervescent preparation and of the pure drug, which it is intended to exhibit in this way, should be more widely known than would seem to be the case, if one may judge from this instance.

Professor J. F. Eykman, in his research on the poisonous and other constituents of *Andromeda japonica*, Thunb., has found in the residuary liquid left after the separation of asebotoxin a crystalline substance which he calls "asebotin" (*New Rem.*, March, p. 66). It forms colourless needles easily soluble in hot or boiling water, but only slightly soluble in cold water, the solution having a very bitter taste. It is also soluble in dilute alkalies, the solution acquiring a brownish-yellow colour on exposure to the air. It has a neutral reaction and does not appear to be poisonous when injected hypodermically in doses of $\frac{1}{12}$ grain. When boiled with a dilute mineral acid asebotin splits up into asebogenin and apparently glucose. Asebogenin forms fine colourless needles, insoluble, or nearly so, in both cold and hot water; in absolute alcohol and ether and also in alkalies it is quite soluble. Asebotin differs from arbutin merely by the elements of water H_2O, its formula being $C_{24}H_{28}O_{12}$, but the two substances are not identical, the crystals of asebotin assuming a red-brown colour in a moist ammoniacal atmosphere, while those of arbutin assume a sky-blue colour under similar circumstances.

In Brazil the root and leaves of *Franciscea uniflora*, a scrophulariaceous plant, popularly known as "manaca," have long had a reputation in the treatment of syphilitic complaints, and have been called for this reason "vegetable mercury." Under the name of "manaca," the drug has been introduced in the United States as an alterative and as useful in the treatment of rheumatism. A specimen having been submitted to Professor Dragendorff for examination he reports (*Ther. Ger.*, iv., 63) that the presence of an alkaloid has been recognized, which acts energetically upon frogs in milligram doses, the respiration being at first accelerated, then retarded, followed still later by gradual diminution of the activity of the heart. The separation of the alkaloid in perfect purity is attended with great difficulty, since it cannot be isolated by shaking it out of aqueous solutions, neither can it be separated undecomposed by precipitation with potassio-mercuric iodide. It is worth mentioning that another drug had been previously received at Dorpat under the same name, which had decidedly different external characters and apparently had had another botanical origin.

"Jamaica dogwood" (*Piscidia erythrina*) is another "new remedy" that has been put forward in the United States, it being recommended as "a positive anodyne in the more purely idiopathic neuralgic affections," and a narcotic and calmative in insomnia arising from mental worry. A liquid extract of this drug has been recently examined by Dr. E. Hart, of the Chemical Department, Lafayette College, who reports (*Ther. Gaz.*, iv., 97) that he has isolated the active principle, which he has named "piscidin," by intimately mixing the liquid with a milk of lime, allowing the mixture to stand half-an-hour in a warm place, filtering and pressing, and adding water to the filtrate until it becomes slightly turbid. After standing a few days the piscidin crystallized out in prisms, and were obtained pure by recrystallization from alcohol. Piscidin is represented by the formula $C_{29}H_{24}O_8$. It is described as being insoluble in water, slightly soluble in cold alcohol and ether, much more soluble in hot alcohol, and freely soluble in petroleum spirit and chloroform. The alcoholic solution is neutral to test paper, and no separation of sugar is caused by boiling with dilute or strong acids. It does not appear what part was used in the preparation of this liquid extract; but according to some notes appended to the paper, the bark, when examined in the laboratory of Messrs. Parke, Davis and Co. yielded two resins, one acid and the other indifferent, minute quantities of a volatile oil, and indications of a volatile alkaloid.

The leaves of *Myrtus Chekan*, which were recommended some two years since by Dr. Murrell as a remedy in winter cough, have been submitted to analysis by Mr. J. Hoehn, who reports (*Weekly Drug News and Am. Pharm.*, vi., 238) that he has recognized the presence of three kinds of glucosides, (1) soluble in benzol and not in water, (2) soluble in benzol and in water, and (3) insoluble in benzol and soluble in alcohol. The leaves also yielded 4·2 per cent. of a tannic acid, and 3·7 per cent. of the volatile oil resembling oil of bay, first noticed by Mr. Hutchinson (*Pharm. Journ.*, [3], ix., 653).

In a recent trade circular, Herr Haensel, of Pirna, mentions that he had received from a mercantile house in Columbia, South America, a quantity of dried flowers derived from a plant described under

the name "*Sulamita vitulus*," which grows abundantly on the eastern spurs of the Cordilleras and is used as a remedy in neuralgic affections. The flowers are said to possess in the fresh state a delicious aroma of such intensity that a single fresh flower laid amongst clothes is sufficient to impart to them a permanent perfume. Distillation of the dried flowers did not give results so favourable as was expected, the yield in essential oil not exceeding one-half per cent., which may have been due to loss occurring during the long journey. The oil was heavier than water, and in its odour markedly resembled salicylate of methyl, which is the principal constituent of oil of wintergreen and also sinks in water. The flowers sent, however, came from a Melastomaceous and not an Ericaceous plant.

At the suggestion of Professor Hegen, of Freiburg, Herr Merck has prepared a phosphate of codeine, which is believed to obviate the difficulty attending the use subcutaneously of the sulphate and hydrochlorate of this alkaloid, in consequence of their comparative insolubility. The phosphate of codeine is described as being soluble in 4 parts of water and containing 70 per cent. of codeine. The same firm prepares a hydrochlorate of cocaine (the alkaloid of *Erythroxylon Coca*), which is soluble in water in all proportions, whilst pure cocaine is only soluble with difficulty in water.

Mr. R. S. Christiani, in the *Oil, Paint and Drug Reporter*, gives a further account of "American musk." He remarks that for soaps and sachets and even for the musk lozenges sold by confectioners it answers well, but that for toilet waters and perfumes its use will be limited, for the odour, though strong, is not sufficiently delicate for a refined taste. The removal of the fatty matter, which seems to be liable to become rancid, would probably render the odour more agreeable. In consequence of the present scarcity of good musk and the consequent high price and scarcity of *Abelmoschus moschatus* it seems probable that the American musk may find a market here, especially as the musk rat (*Fiber zibethicus*), from which it is derived, frequents the marshes of most of the States of North America.

Ten samples of willow bark examined by Mr. Gessler (*Weekl. Dr. News*, vi., 182), with the object of ascertaining the yield of salicin, gave results varying from 1·06 to 3·13 per cent., but usually lying between 2·2 and 2·5 per cent.

It is well known that occasionally very unpleasant results follow the use of a preparation of arnica, which have been sometimes attributed to idiosyncrasy. So far as the tincture of the flowers is concerned Dr. Stieren is of opinion (*Ther. Gaz.*, iv., 9) that the inflammation noticed occurs only when a defective preparation is used, it being due to the non-removal by filtration of minute hooks, derived from the disk florets, which become imbedded in the flesh and cause irritation.

Various samples of commercial "veratrine," entirely soluble in ether and corresponding with the requirements of the German Pharmacopœia, have been the subject of an investigation by Herr E. Bosetti (*Archiv*, xxi., 81). They proved to consist of a very intimate apparently amorphous mixture of two probably isomeric alkaloids, represented by the formula $C_{32}H_{49}NO_9$, one of which is crystallizable and almost insoluble in water ("crystalline veratrine," the "cevadin" of Wright and Luff), whilst the other is not crystallizable, but is soluble in water ("veratridine," the "soluble veratrine" of Weigelin, Schmidt and Köppen). Relatively small quantities of the former suffice to render the latter insoluble in water, whilst a small proportion of the latter will prevent the crystallization of the former. When boiled with an alcoholic solution of barium hydrate, crystallizable veratrine splits up into amorphous "cevidin" ($C_{27}H_{45}NO_9$) and angelic acid; whilst the amorphous "veratridine" splits up into another amorphous base, veratroïne ($C_{55}H_{92}N_2O_{16}$) and veratric acid.

Dr. S. Zeisel reports (*Monatshefte*, iv., 162) that he has obtained from a solution of colchicine in chloroform a well-crystallized compound; but at present he is uncertain whether some chloroform, which persistently clings to the crystals, is only mechanically adherent or in chemical combination. The chloroform can, however, be easily removed by dissolving the crystals in water, and the aqueous solution gives all the essential reactions of colchicine. He also states that in converting colchicine into colchiceine by the action of very dilute sulphuric or hydrochloric acid he obtains as a bye-product the hydrochlorate or sulphate of a new votatile base, which he has named "apocolchiceine," and which is produced in larger quantity, together with methyl chloride, upon heating colchiceine with hydrochloric acid. If this heating of colchiceine be prolonged the apocolchiceine at first formed is converted into another substance, which has the properties of an acid. Colchicine, colchiceine and apocolchiceine are all altered by nascent hydrogen.

In the United States Pharmacopœia both strychnine and the sulphate of that alkaloid are official, the sulphate being described as a neutral salt, containing seven molecules of water of crystallization, and soluble in ten parts of water at 15° C. It having been recently stated (*Berichte*, xv., 1231) that strychnine sulphate of German manufacture, as met with in commerce, is an acid salt with only two molecules of water, Mr. Coleman has examined samples of the commercial salt of American manufacture in order to see how far they correspond with the official description. He reports (*Amer. Journ. Phar.*, xiii., 113) that as manufactured in the United States strychnine sulphate corresponds with the Pharmacopœia requirements in being a neutral salt,—or distrychnine sulphate,—but that it contains only six molecules of water of crystallization, and requires for its solution from 42 to 43 parts of water at 15° C.

In a note read recently before the Philadelphia Society (*Amer. Journ. Phar.*, xiii., 145) Mr. Lehman stated that in preparing the United States official tincture of iodine, which is a solution of 8 parts of iodine in 92 parts of 94 per cent. alcohol, the iodine can be rendered readily soluble, without trituration, by the addition of a little sodium chloride. Professor Maisch pointed out that considering the slight solubility of sodium chloride in strong alcohol this action was rather remarkable.

The *Pistia Stratiotes*, or "tropical duckweed," is a common tropical water-weed, occurring on pools of stagnant water in most parts of India, and having much the appearance of half-grown lettuce plants, to which it owes its West Indian name of "water lettuce." In some parts of India the mature plant is dried, incinerated, and lixiviated, and under the name of "páná salt" the saline product is used for medicinal purposes as a domestic remedy. Speci-

mens of the plant and of the "salt" have been examined by Surgeon-Major Warden, who reports (*Chem. News*, March 23, p. 133) that the weed dried at 130° C. and carbonized yielded 31 per cent. of total ash, of which 6 per cent. was soluble. The sample of "salt" was slightly deliquescent, alkaline in reaction, and had the appearance of dirty common salt. Dried at 130° it yielded 73 per cent. of potassic chloride, 22·6 per cent. of potassic sulphate, and minute quantities of potassic carbonate, sodic chloride, calcic sulphate, magnesic sulphate, and ferric, aluminic and silicic oxides. According to Colonel Drury ('Useful Plants of India,' p. 34) the plant is cooling and demulcent and is given in dysuria, whilst poultices of the leaves are applied to hæmorrhoids. In Jamaica, in the hot dry weather, the *Pistia Stratiotes* is said to impregnate the water in which it grows with its particles to such an extent as to give rise to the bloody flux.

In an account of an investigation into the manner of formation of compound ethers, which was recently laid before the Société Industrielle de Mulhouse (*Chem. Zeit.*, vii., 321), Herr Pabst states that when alcohol, sulphuric acid and acetic acid are heated together, the formation of acetic ether takes place in three stages in a manner analogous to the formation of ordinary ether. In the first place there is a production of ethylsulphuric acid and water:—

$$C_2H_5OH + HO{\cdot}SO_2OH = C_2H_5O{\cdot}SO_2OH + H_2O.$$

In the second stage ethyl acetate is formed, whilst sulphuric acid is reformed and acts upon a fresh quantity of alcohol to convert it into ethylsulphuric acid:—

$$C_2H_5O{\cdot}SO_2OH + C_2H_3O{\cdot}OH = C_2H_5O{\cdot}C_2H_3O + HO{\cdot}SO_2OH.$$

Herr Pabst confirmed this by allowing methylsulphuric acid to act upon a mixture of acetic acid and ethylic alcohol, when he obtained methyl acetate and ethylsulphuric acid, the latter reacting with the remaining alcohol and acetic acid, yielding ethyl acetate; upon suspending the operation scarcely any methylsulphuric acid was found. Herr Pabst recommends as a practical method of preparing acetic ether the addition of equal molecules of strong alcohol and glacial acetic acid to ethylsulphuric acid heated to 135° to 140° C.

Herr Rammelsberg (*Ber.*, xvi., 273) describes a sesquicarbonate of potassium which had been produced by the evaporation of a large quantity of solution of bicarbonate of potassium in Struve's mineral water manufactory. The crystals, which belonged to the rhombic system, were represented by the formula ($2K_2CO_3,H_2CO_3.3H_2O$). The conditions under which they were formed are not understood, as all attempts at their reproduction failed. When a solution of potassium bicarbonate was exposed for a fortnight over caustic potash and sulphuric acid, so that half the carbonic acid was withdrawn, potassium carbonate was formed. By heating a solution of potassium bicarbonate until half the carbonic acid has been expelled, potassium carbonate was formed in the solution, whereas in order to obtain the sesquicarbonate it is theoretically necessary to expel three-fourths of the carbonic acid.

In the same number of the *Berichte*, Professor Spring describes some more chemical compounds which he has produced by submitting the elements in a fine state of division to a pressure of 6500 atmospheres. In this way the arsenides of zinc, lead, tin, cadmium, copper and silver were obtained and behaved normally under the influence of chemical reagents.

Messrs. Kelbe and Lwoff (*Ber.*, xvi., 351) have found methyl alcohol among the numerous products yielded by the destructive distillation of resin (colophony). It occurs in the aqueous portion of the distillate, together with acetic acid and the higher acids of the same series. One hundred and fifty kilograms of the commercial product yielded about 50 grams of pure methyl alcohol.

The recently issued Report by the Medical Officer to the Local Government Board contains an account of some observations of Dr. Klein upon septic bacteria, which have an interesting bearing upon the "attenuation" theories of M. Pasteur. Dr. Klein finds that the specific bacillus of a disease, such as anthrax, undergoes in the course of its own proper life remarkable changes in its powers. For instance, as a consequence of the formation of spores in the bacilli the material containing them appears to acquire a new virulence; it is, therefore, important to know that the formation or non-formation of these spores is largely a matter of definable circumstance and condition. Further, after several weeks of growth in any of the cultivation materials used by Dr. Klein the anthrax bacillus was found to undergo degeneration, but apparently through exhaustion of pabulum. This alteration, however, was not of the nature of "attenuation," since, if any effects were produced by inoculation with the liquid they were of the same fatal nature as before the alteration, and the change was in the number of active bacilli and not in the potency of those who remained active. Dr. Klein has not been able to discover any indication of such a loss of intensity during successive cultivations as would allow of the material of a late cultivation being introduced into the body of an animal as a protection against the disease, or without killing or doing the animal serious injury. Therefore, whilst Dr. Klein guards himself from throwing doubt on the discovery by M. Pasteur of a material protective against fatal anthrax in sheep, he says that something more is required for the production of an "attenuated" virus than the recognized method of successive cultivations in organic liquids at 42° C., and that these conditions have not transpired from M. Pasteur's laboratory.

Professors Liveing and Dewar have been working on the reversal of the principal lines of hydrogen, and their results are embodied in a paper read before the Royal Society on March 8, entitled "Spectroscopic Experiments with the Arc." They find that when a short induction spark is taken between electrodes of aluminium or magnesium in hydrogen at atmospheric pressure, a large leyden jar being in the secondary circuit, no reversal is obtained; but on increasing the pressure by half an atmosphere, the lines expand, and a fine dark line may be seen in the middle of the F line. As the pressure is increased the dark line becomes stronger, so that at two atmospheres it is very decided. As the F line expands the dark line expands too and becomes a band. It is best seen when the pressure is between two and three atmospheres; at higher pressures it becomes diffuse and at five atmospheres it can hardly be traced. No definite reversal of the C line is observed with the dispersion of a one-prism spectroscope. By using greater dispersion than this, however, the reversal of both C and F lines was observed at lower pressures. The authors find that

both the C and F lines of hydrogen are visible in the arc of a De Meritens machine taken in hydrogen, but in the arc of a Siemens machine the C line can only be detected at the moment of breaking the arc, the F line hardly at all. If instead of taking the arc in hydrogen, small drops of water are allowed to fall from a fine pipette into the arc taken in air inside a lime crucible, each drop, as it falls into the arc, produces an explosive outburst of the hydrogen lines. Generally the outburst is only momentary, but occasionally a sort of flickering arc is maintained for a second or two and the hydrogen line C is visible all the time. The lines C and F are usually much expanded, but are frequently very unequally wide in different parts of the line. F is weaker, more diffuse, and more difficult to see than C and is visible for a shorter time. There is no sign of reversal. In the explosive character of the outburst and the irregularity in the width of the lines, the effect resembles that of an outburst of hydrogen in the solar atmosphere.

Mr. W. H. Preece has contributed an elaborate and valuable paper to the Royal Society on "The Effects of Temperature on the Electromotive Force and Resistance of Batteries." The author concludes from his very numerous experiments that changes of temperature do not practically affect electromotive force, but that they materially affect the internal resistance of cells; also, that of the various forms of batteries in practical use, the Daniel is the most seriously influenced by variations of temperature, and that in all experiments with that battery, either the temperature must be kept constant or frequent measurements should be taken of its internal resistance, and allowances made for the variation.

It is reported that a test of a telephone between New York and Chicago, a distance of one thousand miles, has proved a great success. The result is attributed principally to a novelty in the conductor, which consisted of a steel wire core, copper plated, the electrical resistance of which through this distance was only 1522 ohms, instead of upwards of 15,000 ohms, which would represent the average resistance of ordinary telephonic wire.

Herr Pringsheim has contributed (*Annalen*, 1883, No. 1, *Phil. Mag.*, Feb.) an exhaustive paper detailing experiments made to exactly determine the cause of radiometer motion. In a perfectly simple radiometer, freed from needless complications of technical construction, there are three essential parts, all or each of which might conceivably affect motion: the glass case, the enclosed gas, and the vanes. A radiometer was therefore constructed which excluded as far as possible the introduction of conditions other than these. It consisted of a tube having a bulb at one end and a stopper fitting air-tight at the other; on the end of a long glass thread suspended from the stopper was cemented a very thin microscope covering glass, silvered at the back, which thus formed a mirror; to the back of this was affixed one side of a small rectangular disk of mica, which acted the part of the vane in an ordinary radiometer. The apparatus was then exhausted by means of parallel arms let in just below the stopper. The readings were taken in the ordinary way by reflection to a graduated scale. The first experiments were made to determine the part played by the glass case. To eliminate the difference in temperature of the two sides of the vane, which occurs when one side of a thick plate is heated, an extremely thin mica plate was used, and thus also the absorptive power was reduced to a minimum. When the glass case was heated by a Bunsen burner upon that side which was nearest to the vane, powerful repulsion occurred; that is to say, the mica plate receded from the source of heat. If it be assumed that the sides of the mica vane are of the same temperature, this effect would be due to the heating of the glass tube. This was actually proved by a later experiment, when the side of the glass case which was farthest from the vane was heated, the vane itself being at the same time shaded so that it was outside the cone of heat, and yet repulsion occurred, though, of course, not to the same extent as in the first experiment. In fact, it was subsequently shown that the whole of the repulsive effect was produced by the heating of the portion of the glass case immediately opposite the mica vane. Under the above conditions, where the vane is not directly heated, the result is unaffected by the nature of the vane; a mica vane, blackened on one side and hence possessing absorptive power in the highest degree, gave practically the same result, when each side was alternately shaded and the glass case alone heated, both sides of the vane being repelled to the same extent. Hence the repulsion is a direct effect of the heat communicated by the glass case through the particles of residual gas to the vane suspended in front, and not a secondary one due to the absorption by the vane of heat radiated from the case; thus the amount of this motion is not affected by the nature of the vane. Having thus determined the action of the glass case, it remained to investigate that of the residual gas and of the vanes. The residual gas was found in no way to directly concern the phenomena. When the vanes were made of different substances and directly heated some interesting facts were observed. When a mica plate was blackened on one side and heated on the clear side, first attraction occurred, then oscillation, followed by repulsion. This was due to the conduction of the heat through the thin mica plate to the lampblack, hence the apparent attraction; then the slow heating of the mica plate, when the normal repulsion occurred. The results of these experiments and of others with metallic vanes showed that conduction of heat from one side of the vane to the other is one of the most important factors in radiometric motion. The results of all the experiments upon radiometer motion are summed up in the following general statement or law. A surface element (vane) at which heat enters or leaves the rarefied air undergoes a repulsion of which the amount is proportional to the intensity of the heat current. The author adopts the kinetic theory to explain radiometer motion; the air molecules are heated by the glass case and then rebound to the vane and thus repulsion occurs.

The increased range of rifled arms, involving the exposure of troops to the effects of firing at greater distances, has rendered it very important that for active service, at least, a uniform should be adopted which is as little conspicuous as possible, and a "Colour Committee" appointed to experiment and advise the Government as to the comparative visibility of different colours suitable for military uniform has just presented its report on the subject. The experiments, which were under the immediate superintendence of Professors Abel and Stokes, were

carried out under varying conditions of weather, atmosphere, surroundings and background, and the general result was to eliminate all the colours at present used in the dress of the regular army. It is reported that under ordinary circumstances white is much the most conspicuous, and black, with which the dark green and dark blue of the service are practically identical, is also extremely conspicuous. The scarlet of the service is, as might be expected, very conspicuous, but its relative rank depends upon the amount of light; in a bright light it is more conspicuous than black, though not equal to white, but on a dull day and at a considerable distance scarlet and black are almost equal, whilst in a failing light black would be the more conspicuous. Red and crimson are a little less conspicuous than scarlet. The nearest approach to invisibility is attained by the use of neutral or nearly neutral tints, such as are met with among the service colours of the volunteers, and it depends far more on a proper depth of shade than on what the tint may be. Of course the conditions of invisibility on the sky line are very different.

CULTIVATION OF CINCHONA IN JAMAICA.*

NOTES ON SPECIMENS OF CINCHONA SENT TO THE PHARMACEUTICAL SOCIETY OF GREAT BRITAIN FROM THE GOVERNMENT PLANTATIONS.

BY D. MORRIS, M.A.,

Director of Public Gardens and Plantations in Jamaica.

No. 1. *Cinchona officinalis*, of the ordinary type of the Government plantations, Jamaica. Specimens of leaves, flowers, fruit and seed. Three kinds of bark, viz., root, stem and twigs. All the specimens with the exception of the seeds (in a separate packet) have been taken from the same tree, so that botanical specimens as well as samples of bark, are exactly identical.

With reference to this species of cinchona in Jamaica the following extract from official reports and letters from Mr. John Eliot Howard, F.R.S., on similar specimens will be of interest.

"*Cinchona officinalis* of the Jamaica plantations.—The average price per pound on all qualities, viz.: root, stem and branch bark, 6*s.* 7*d.*; highest price realized, 10*s.* 1*d.* per pound for root bark; lowest price realized, 2*s.* 3*d.* per pound for twig bark."

The tree from which the specimens were taken was about nine years old, and growing at an elevation of 5500 feet. Mr. Howard's analysis of the trunk bark is as follows:—

Quinine alkaloid . .	5·18	= Quinine Sulphate . .	6·95
Cinchonidine . . .	0·22		
Cinchonine	0·01		
Quinidine	0·15		

Mr. Howard adds:—"This bark does not require many observations, as the price per pound agrees with the appearance of the bark and with the analysis in showing that it is good *Cinchona officinalis*, perhaps of slightly varying forms."

No. 2. *Cinchona succirubra*, of the ordinary type of the Government plantations, Jamaica. Specimens of leaves, flowers, fruit, seed and three kinds of bark, viz., root, stem and twigs; all the specimens have been taken from the same tree.

"*Cinchona succirubra* of Jamaica plantations. Average price per pound on all qualities, viz., root, stem, and branch bark, 4*s.*; highest price realized 5*s.* 7*d.* per pound for root bark; lowest price realized 1*s.* 3*d.* per pound for twig bark." Specimens sent from trees nine years old, growing at an elevation of 5000 feet. Mr. Howard reports on this bark as follows:—"Very good and true *Cinchona succirubra*, agreeing well with my specimens from South America. It is a *sub-pubescent* form."

No. 3. *Cinchona hybrid* of the Government plantations, Jamaica. Specimens of leaves, flowers, fruit, seed and three kinds of bark, viz., root, stem and twigs. All the specimens have been taken from the same tree. Supposed to be a hybrid form between *Cinchona succirubra* and *Cinchona officinalis*. Up to 1879 it was considered by Mr. Thompson to be *Cinchona Calisaya*. Average price per pound on all qualities, viz., root, stem and branch bark, 6*s.* 1¾*d.*; highest price realized 7*s.* 9*d.* per pound for trunk bark; lowest price realized 4*s.* 6*d.* per pound also for trunk bark. The specimens taken from a tree nine years old, growing at an elevation of 5300 feet. Mr. Howard's analysis of trunk bark is as follows:—

Quinine alkaloid . .	6·00	= Quinine sulphate . .	8·00
Cinchonidine . . .	0·73		
Cinchonine	0·10		
Quinidine	0·03		

Mr. Howard adds "What proof is there that this is a hybrid? What connection with Calisaya? It is an excellent bark, resembles true *Cinchona officinalis*, var. *Uritusinga*." In another communication Mr. Howard remarks, "It is evident that the so-called 'hybrid' No. 4, if only it is a free grower, must be about the most valuable of all the sorts. The price obtained in commerce does not seem proportional to its value; but possibly, as remarked before, it may be an exceptionally fine specimen. So far as I can judge by the botanical specimens it is a true form of *Cinchona officinalis*."

With regard to the above remarks on this "hybrid" form, I would mention that although in single specimens of leaves, flowers, etc., it is almost impossible to decide its hybridity, yet on the plantations, where all gradations may be distinguished from among these trees, from almost the pure *succirubra* type to almost the pure *officinalis*, there can be no doubt of their origin. Again, when seed of this kind was sent to Kew the seedlings and plants were pronounced of a decidedly "hybrid" character; and, lastly, although following Mr. Thompson's classification, I shipped the bark at first to the London market as "Calisaya?", the brokers in their report drew my attention to it and remarked, "It is not pure yellow bark, but supposed to be a hybrid with *succirubra*." It is nevertheless gratifying to find that this bark is of so valuable a character, and as it is a free grower at lower elevations, steps are being taken to propagate it for general distribution. According to the analysis of the specimen bark sent to Mr. Howard its market value would not fall far short of 14*s.* per pound.

No. 4. *Cinchona Calisaya* of the Government

* Read at an Evening Meeting of the Pharmaceutical Society, March 7, 1883.

Plantations, Jamaica. Specimens of leaves, flowers, fruit, seed and three kinds of bark, viz., root, stem and twigs. All the specimens have been taken from the same tree. These trees are about 9 or 10 feet high at five or six years old; they were formerly included under *Cinchona officinalis*. Their compact hardy habit and early maturing render them very suitable for steep slopes. Mr. Howard's analysis of trunk bark is as follows:—

Quinine alkaloid . .	3·70	= Quinine sulphate . .	4·93
Cinchonidine . . .	0·60		
Cinchonine	·35		
Quinidine	·05		

Mr. Howard adds "these trees appear to me to be true to the Calisaya type and form a valuable portion of the plantations. I should not think they belong to either the Josephiana or the Ledgeriana form, but that the exact variety is perhaps not yet published. In the meantime it might be well to call them *Cinchona Calisaya* simply. There is no appearance of 'hybridity' nor any resemblance to the Loxa (officinalis) barks."

No. 5. *Cinchona Ledgeriana*. Specimens of the leaves and flowers from one of three plants (the broad leaved form) of this species sent out by Mr. John Eliot Howard, F.R.S., through the Royal Gardens, Kew, in 1880. For description and plate of the original of these plants, see *Gardeners' Chronicle*, 1880, vol. 12, p. 457. The plant from which the specimens were taken was 6 feet high: some trunk bark is sent herewith.

No. 6. Specimens of leaves and flowers of a tree supposed to be *Cinchona micrantha*, not determined.

SECONDARY BATTERIES.*

BY H. ALLEN, B.SC.

I have thought that a brief account of the latest improvements in secondary batteries, accumulators, or storage cells, as they are variously called, as well as of recent investigations touching the chemistry and general behaviour of the same, might be of interest to the members of this Association. And since the ideas of the general public, and even of students, on the subject of electricity are apt to be more extended than precise, I propose to introduce the subject by a few remarks on the nature of the voltaic cell, and of storage cells in particular.

The voltaic cell may be defined as an arrangement for transforming chemical energy into a current of electricity. To produce a current of given energy for a given time a definite amount of chemical energy has to disappear. The energy of such current can be stored up, or converted into motion, or may pass immediately into the form of heat and its availability be thereby diminished or lost.

The materials generally used in the cell for the production of the current are two different elementary solids and one or more compound bodies, one at least liquid, separating them.

When a plate of copper and a plate of zinc are placed in contact, a difference of potential or electro-motive force is produced, the zinc becoming positive and the copper negative. This difference of potential corresponds to difference of level in the case of water or to difference of pressure in the case of gases. Suppose two such plates touching at two points, a current tends to flow in the copper towards both points of contact, but such tendency is at one and the same time in opposite directions so that no actual current is produced, but only a certain amount of something analogous to strain. If, now the plates still touching at one point be separated at the other by a liquid, such as dilute sulphuric acid, this "strain" is relieved by the chemical action of the acid upon the zinc and the current is free to flow throughout the circuit from copper to zinc through the external contact and from zinc to copper within the liquid, or electrolyte, and this current will continue as long as the requisite energy is supplied by the combustion of the zinc.

The strength of the current (C) in any circuit varies (1) directly as the electro-motive force (E) of the producing cell, which depends solely upon the materials employed, and (2) inversely as the total resistance (R) of the circuit and cell, that of cell depending on the size of the plates, their distance apart and the nature of the electrolyte separating them. If then E and R be known, C is immediately determined without any reference to what is vaguely known as the size of the cell. *The size does not enter as a separate factor into the determination of the current producible by any cell*, any more than the quantity of water in an elevated cistern determines the rate at which it can be drawn off by a given pipe or the pressure which it is capable of exerting.

The energy of the current, *i.e*, the work it is capable of doing, is equal to the product of E and C. If E be expressed in volts and C in ampères and t be put for time of duration of current in minutes, then work done by cell $= E \times C \times t \times 44{\cdot}25$ foot lbs. This energy may be spent entirely in heating the cell and circuit, the heating effect in any part varying with its resistance, or it can be stored up or converted into motion.

A simple analogy may be of use in explaining what has been stated. Suppose a closed circuit of water pipes with a force-pump at some point of it worked by a spring. The pump will produce a continuous current in the circuit, the amount of water circulating in a given time depending partly on the pressure of the pump-piston, and partly on the size of the pump and pipes. The energy imparted to the water may be spent entirely in friction against the pump and pipes, the friction and consequent heating effect being greatest where there is the greatest resistance to the flow. But the water might be made to work a second pump and thereby wind up a second spring. In this case the energy of one spring is transferred by means of the water to the other spring, but of course there is no storage of water. Lastly, if water were continually supplied to the pump from a cistern, it could be raised to a higher cistern and there stored up.

The energy of the voltaic cell can be stored up in two ways somewhat analogous to the above. The electricity produced by chemical action in the cell can be stored up *as such* in a Leyden jar, just as the water in the pump just mentioned might be stored in a cistern. But it can also be transformed again into chemical energy and retained as such for future use, the current being merely used as a carrier of the energy, just as the water was the means used for transferring energy from one spring to the other. An arrangement for effecting this object is called a secondary battery, or a storage cell. *Such cell does not store electricity.* In fact there is no more electricity in it than in a pound of zinc or a quart of acid, but it contains bodies capable of acting chemically on each other and thus supplying the requisite energy for the production of a current of electricity. It differs from an ordinary cell merely in the fact that the materials used are manufactured in the cell itself instead of being put in ready made.

A storage cell, then, may be defined as an arrangement for transforming the energy of a current of electricity into chemical energy and retaining the same available for the reproduction of the current. The following experiment illustrates the mode of action. One form of Daniell's cell consists of a plate of copper immersed in

* Paper read before the School of Pharmacy Students' Association.

solution of copper sulphate and a zinc plate immersed in solution of zinc sulphate, the direction of the current being from zinc to copper within the cell. The energy of the current is supplied by the combustion of the zinc, $ZnZnZnSO_4CuSO_4Cu$ becoming $ZnZnSO_4ZnSO_4CuCu$. If a current from two such cells be sent through a third cell consisting of two copper plates immersed in solution of zinc sulphate, zinc is deposited on one plate and copper taken off the other, $CuZnSO_4ZnSO_4CuCu$ becoming $CuZnZnSO_4CuSO_4Cu$. The current flows through this cell from copper to zinc, *i.e.*, to the plate which has become coated with zinc, and the cell has become, in fact, a Daniell's cell ready to produce a current in the direction opposite to that of the forming current.

If the above be clearly understood, the theory of the storage cell is known It will be at once seen that the E. M. F. of the charging battery or machine must exceed that of the cell to be charged, but it is not necessary or desirable that it should exceed it by a large amount. The strength of the charging current will generally exercise an effect on the nature of the products formed, and, therefore on the E. M. F. of the cell. Thus the E. M. F. of a gas battery (a form of secondary battery) varies from 1·49 to 3·57, according to the mode of formation.

Various forms of storage cells have been devised since the original cell of M. Planté. Planté's battery and Faure's accumulator are well known. Cells embodying the latest improvements in the latter of these are now being supplied, under the name of Faure-Sellon-Volckmar accumulators, by the Electrical Power Storage Co., Limited, of Great Winchester Buildings, E.C., who have kindly sent a few of these cells for exhibition and have supplied me with information as to their construction, etc. Each cell consists of a number of lead plates cast in the form of window frames, the apertures being square of about $\frac{1}{4}$ inch side. The positive plate, corresponding to the zinc plate of a Daniell's cell, has its apertures filled up with litharge made into a paste with dilute sulphuric acid, and the negative plate is filled in with a paste of red lead and acid. There is no felt or other such material to separate the plates, but they are just kept apart by india-rubber bands. The advantages of this arrangement are—(1) that the red lead is prevented from falling away from the plates; (2) that there is less chance of short circuiting than where felt or canvas is employed.

The plates, alternately + and —, are immersed in sulphuric acid of sp. gr. 1·25 (about 27 per cent.). The resistance of the small cells is about ·003 ohm and the E. M. F. 2·15 volts.

Sutton's cell has been already described in these pages, but I not aware that it possesses any particular advantages. Swan has found that a pair of lead plates that have been used as negative plates in a Sutton's cell can be advantageously employed in the construction of a Planté cell.

A storage-cell when made has to be "formed," *i.e.*, got into working condition. This, which was a most tedious process in Planté's cell, is accomplished in Faure's cell by one charging with a powerful current, and occupies fewer hours than the former required weeks.

For a particular cell there will be an economic rate of charge and discharge; thus, for what is termed a 1 horse-power cell (weighing about 30 lbs.), *i.e.*, a cell that will yield as much energy as a horse-power or 33,000 foot lbs. per minute continued for one hour, that is 1,980,000 foot lbs., the rate of charge recommended is 20 to 25 ampères, and that of discharge is 30 to 40 ampères. If these conditions be observed the cell should yield over 90 per cent. of the energy put into it, the loss being due to the heating of the cell during charge and discharge, which heating it is impossible altogether to avoid, though it may be diminished indefinitely by keeping the E. M. F. of the charging battery or machine as little as possible above that of the storage-cell. By so doing, however, the rate of charging is diminished, so that practically a sensible amount of loss must be submitted to. If E, R, be the E. M. F. and resistance of the charging cell and e, r, that of the storage cell—

$$\text{the total work spent in charging} = \frac{(E-e)E}{R+r}$$

$$\text{the loss by heat in both cells} = \frac{(E-e)r}{R+r}$$

$$\text{the energy stored} = \frac{(E-e)e}{R+r}$$

Hence it follows that the greatest economy is obtained by increasing both E and e, while their difference is kept as small as practicable, *i.e.*, a number of cells should be charged in series from a powerful machine, with just sufficient E. M. F. to send a current through them.

In conclusion, I wish to call your attention to a few points connected with the chemistry of the cell, with especial reference to the investigations of Messrs. Gladstone and Tribe, published in *Nature* last year. When dilute sulphuric acid is electrolysed between lead plates by a powerful current, the oxygen formed becomes partially ozonized and forms peroxide of lead on the plate at which the current enters, the first action being $PbH_2SO_4PbPb = PbH_2PbSO_4Pb$; then the ozone formed by further action attacks the sulphate which adheres to the plate, forming peroxide of lead (PbO_2) and reproducing the acid. This action occurs in Planté's cell. When the cell is at rest after charging, the lead with its coat of peroxide is gradually attacked by the acid, hydrogen is evolved and lead sulphate formed again. This local action, as it is termed, is well known in other cases, particularly in the zinc and copper couple, which is capable of decomposing water, and is violently attacked by dilute acid. In the case of lead, however, the action is delayed by the insoluble nature of the sulphate formed, and to this insolubility is probably due the practicability of the Faure cells. In Planté's cell, after a rest, the current was reversed, when the peroxide or sulphate previously formed became reduced to spongy metal and the other plate in turn became peroxidized. By repeating this process, both plates became coated more and more thickly, the one with spongy metal, the other with peroxide.

Let us now consider the case of the latest modification of the Faure cell. Here starting with $Pb3PbO\ Pb_3O_4\ Pb$, neglecting the acid, we obtain by charging $Pb3Pb\ 3PbO_2Pb + O$; in the presence of acid part of both oxides is converted into sulphate, forming $Pb,3PbSO_4\ 2PbSO_4,PbO_2,Pb$, and the sulphate is reduced and oxidized in the same way as the oxide. The reduction of the latter part of the sulphate appears to be effected with considerable difficulty, hence the oxidizing action is completed first, unless the quantity of litharge used be proportionally less than that of the red lead. During the charging the local action above referred to occurs continuously, so that the oxidation of the sulphate will never be quite complete. In the discharge reverse actions occur, the spongy lead being oxidized and the peroxide reduced, but as there is always a considerable quantity of each of these left, mixed with the sulphate, the appearance of a discharged cell differs little from that of a charged one. If discharged very rapidly the E. M. F. sinks almost to *nil*, and the current falls off. This, according to Messrs. Gladstone and Tribe, is due to the formation of a film of peroxide on the spongy metal of the positive plate, whereby both plates become alike. On leaving the cell at rest for a short time this peroxide is reduced, and the E. M. F. and current rise to their previous amount. This action is of the same nature as that which occurs in ordinary single fluid cells, and is known as polarization.

When a storage cell is at rest the local action above-mentioned goes on continuously, and hence the energy of the cell gradually runs down.

The Pharmaceutical Journal.

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CULTIVATION OF CINCHONAS.

THE very interesting series of Jamaica cinchona barks, accompanied by leaves, flowers, fruits and seeds of the plants from which they had been taken, which attracted the attention of visitors to the last Evening Meeting of the Pharmaceutical Society, supplemented as it has since been by an even more extensive series from the Indian Government plantations at Ootacamund, which will be shown on Wednesday evening next, will contribute to a realization of the great importance that the experiments in cinchona cultivation in different parts of the world are now assuming towards pharmacists or consumers of bark. It is indeed a matter for congratulation that the authorities at the Indian and Colonial Offices have complied so liberally with the request of the Council of the Pharmaceutical Society, that typical specimens grown in the Government plantations should be made accessible to the inspection of British pharmacists by being placed in the Society's Museum, especially as they are accompanied by useful information as to their history and characters, such as has been furnished by Mr. MORRIS, and appears on another page of this number of the Journal. Whilst the subject is thus somewhat prominently under notice, it will be opportune to quote from two official reports that have just been issued some statements bearing upon cinchona cultivation in India and Jamaica.

From the new Report on the Trade of British India we learn that the exports of cinchona bark from that country during the year 1881–82 showed a considerable decline as compared with the previous year, the quantity being only 428,497 pounds against 699,258 pounds in the previous year, the fall in value being from Rs. 7,24,705 to Rs. 4,58,340. This decline, however, does not appear to be attributable to any decrease in the production of the plantations, but to the fall of price in the European market caused by the enormous importations of cuprea bark from South America. Indeed the Collector of Customs at Calcutta expressly states that, if necessary, there could have been larger shipments made than in the preceding year, the trees not having been barked in consequence of the lowness of price. It must not be assumed, however, that the figure reached was therefore one below the point at which cinchona cultivation can be carried on in India profitably; for the bark was simply withheld in expectation of a rise in the market. But should the decline in value prove permanent, the Report says there can be no reason to doubt that the industry is one which has a very hopeful future, notwithstanding it may have to compete with importations from South America. The bark is exported almost exclusively from Calcutta and Madras, a very small quantity being sent from British Burmah. The quantity exported from Calcutta, which is said to represent almost entirely the exports of one company in the Darjeeling district, amounted in 1881–82 to 249,694 pounds, valued at Rs. 1,86,795; the exports from Madras amounted to 178,467 pounds, valued at Rs. 2,71,195. These figures show that the average price of the bark shipped from Calcutta was very much below that shipped from Madras.

It is interesting to observe in the face of the foregoing figures, suggesting an accumulation of bark in the country, that the imports of quinine rose during the same time enormously, having amounted to 10,615 pounds, valued at Rs. 9,98,631, in 1881–82, against 3964 pounds, valued at Rs. 4,29,515, in 1880–81. As these figures show that the large increase in the quantity of quinine imported was accompanied by a considerable fall in price, it is probable that both the decrease in exports of bark and the increase in imports of quinine were to a considerable extent due to the disturbing influence of the enormous supply of cuprea bark thrown upon the market as raw material. The figures, however, have a further significance, since they show that a low-priced quinine is capable of driving all its competitors out of the field. In the previous report it had been remarked that the "cinchona alkaloid" had been largely used in preference to quinine, and to this preference was attributed some falling off in the imports of quinine; but the larger consumption of the mixed alkaloids would now appear to have been based rather upon economical considerations. The increased demand for quinine may, however, have been due to some extent to the fact that although the general health of the country was fairly good during the year, there were severe outbreaks of malarious fever in certain districts in Bengal; whilst in parts of Northern India also fever was more than usually prevalent.

A Supplement to the *Jamaica Gazette* of the 22nd ult. contains the report of the Director of Public Gardens and Plantations in Jamaica for the year ending September 30, 1882. In this Report Mr. MORRIS states definitely that the purpose of the Government in establishing cinchona plantations in Jamaica,—namely, to show that cinchona barks of good quality could be produced in the island, and that cinchona planting, as an enterprise in private hands, possesses all the elements of a remunerative industry,—has been attained, these points

having been demonstrated by the returns from the sale of Jamaica-grown barks during the last three years. It is therefore proposed henceforth to devote the chief attention in the Government plantations to the introduction and cultivation, on a small scale, of all new and rich kinds of cinchonas, with a view to establishing them as far as possible in the island, and to carrying on experimental and scientific work in connection with the industry, such as is not likely at present to be undertaken by private individuals. The extent to which Mr. Morris has succeeded in impressing upon others his conviction as to the remunerativeness of cinchona cultivation is shown by the fact that during the year the sales from the Government nurseries to private planters amounted to 372 ounces of seeds, 77,961 plants and 362,250 seedlings of various species of cinchona, *C. officinalis* appearing to be the one most in demand. One shipment only of bark to Europe was made during the year, and this consisted for the most part of "thinnings" or "prunings" from two plantations, rendered necessary by the too abundant growth of established trees and self-sown seedlings. Notwithstanding, however, that the consignment, amounting to 21,512 pounds, consisted consequently principally of twig and broken bark, and the somewhat unfavourable condition of the market, the results were very satisfactory, the net amount realized being £2419 5*s.* 7*d.*, the prospective estimate having only been £2000. As compared with consignments from other countries the prices obtained for this Jamaica-grown bark were very encouraging. The highest price, 8*s.* per pound, was paid for 248 pounds of root bark of *C. officinalis*, taken from trees eight or nine years old, whilst a large package of stem bark realized 4*s.* 11*d.* per pound. The largest parcels were 7844 pounds of "small branch" bark which fetched 3*s.* per pound, and 6151 pounds of twig bark, derived from young shoots and saplings, probably not more than a year and a half old, which realized 1*s.* 5*d.* per pound. Since the actual cost of barking, curing and shipping amounted to only about 7½*d.* per pound, it is evident that even these young growths yielded a fair margin of profit.

PHARMACY IN VICTORIA.

The receipt of the Second Triennial Report of the Pharmacy Board of Victoria enables us to take a brief glance at the results following legislation in restriction of the practice of pharmacy in one of the most important of British colonies. At the end of six years after the passing of the colonial Act, the Pharmaceutical Register of Victoria contains 669 names, showing an increase of 62 during the period covered by the Report. Registration is obtainable as a "pharmaceutical chemist" under this Act either in virtue of having had a certain status at the time of the passing of the Act, possessing the qualification of the Pharmaceutical Society of Great Britain or some recognized examining board, or passing one of two examinations—the Major or the Modified—before the Victoria Pharmacy Board. It will, therefore, be interesting to notice to what extent a qualification which it has been suggested should be made interchangeable with the English one is being conferred as the result of passing an examination test. The Major examination is open only to persons who have served not less than four years' apprenticeship and attended one course of lectures and passed an examination at a recognized school in materia medica and medical botany, and in practical chemistry, besides having passed an examination before the Board in practical pharmacy. Three of these examinations have been held in the three years, at which there have been five candidates, all of whom passed. The Modified examination is open to persons who have served more than three years' apprenticeship, the apprenticeship having commenced three months before the passing of the Act. There have been twelve of these examinations held in the course of the three years, at which there have been 36 candidates, of whom 26 passed. As during the same period there were 99 registrations effected, it follows that 58 persons became entitled to call themselves "pharmaceutical chemists" without having undergone examination, against 41 who passed either the Major or the Modified.

The Preliminary examinations appear to give promise of a larger number of candidates for the Major in future years, twelve examinations having been held, at which there were 112 candidates, of whom 68 passed. We notice with satisfaction that, in virtue of powers conferred upon the Board, a regulation has been passed making it compulsory for every person, before entering into articles of agreement to be an apprentice within the meaning of the Act, to pass the Preliminary examination. A further provision also makes it compulsory to register the apprenticeship indentures within three months of their execution.

A number of prosecutions under the Victoria Pharmacy Act have been instituted during the last three years, and one of them deserves especial mention. It was in respect to a "pharmaceutical chemist" who had been tried and convicted for manslaughter. The Board thereupon took proceedings against him under the section of the Act relating to erasure for improper conduct, on the charge of "practising surgery other than in accordance with the rights and privileges of chemists and druggists in their open shops." The defendant, being convicted, was sentenced to three months' imprisonment and fined one shilling, and on the recommendation of the Board, his Excellency the Governor in Council approved of his name being erased from the Register.

The Pharmacy Board of Victoria is also entrusted with the administration of the colonial "Sale and

Use of Poisons Act," and upon urgent representations that "poisons" were being sold by grocers, ironmongers, and others, as "vermin killers," without restriction, it took action and instituted prosecutions in upwards of fifty cases. The results were, however, hardly satisfactory, since although convictions were obtained the penalties imposed by the magistrates were not such as to warrant the Board in continuing to bring forward fresh cases. In concluding its Report the Board expresses an opinion that the Act at present in operation regulating the sale of poisons is imperfect in many respects, and a hope that at no distant date an amendment of the Act may be brought under the consideration of the colonial legislature.

EVENING MEETING.

The last Evening Meeting of the Pharmaceutical Society for the present session will be held on Wednesday evening next, at half-past Eight o'clock, when the following papers will be read:—"The Bitter Principle of *Hymenodictyon excelsum*," by W. A H. Naylor, F.C.S.; and "Remarks on Medicinal Plants of Ceylon," by W. C. Ondaatje, F.L.S., Colonial Surgeon of Ceylon. As mentioned on another page, a complete series of barks and herbarium specimens, illustrating the varieties of cinchona plants cultivated at Ootacamund, have been received for the Society's Museum through the Secretary of State for India. These will be placed on the table and will no doubt add greatly to the interest of the meeting.

If original research is really to be fostered by subsidies, sanitary science ought to make considerable progress under the influence of the liberality of the Grocers' Company. This guild has announced its intention to establish three Research Scholarships, each of £250 a year, the holders of which are to devote themselves to researches as to the causes of important diseases and the means by which these causes may be prevented or obviated. Besides these Scholarships there is to be a Discovery Prize of £1000, to be awarded once in four years as a reward for original investigation that shall have resulted in important additions to exact knowledge in specified sections of sanitary science. Two of the appointments to Scholarships are to be made and the first subject for the Discovery Prize is to be announced in the coming month of May, and the third Scholarship is to be filled in May, 1884.

* * *

In an interesting report on the petroleum trade of Báku, on the Caspian, Mr. Consul Lovett mentions that in the refineries the distillation of the crude product is now carried on with plant of the most approved construction, under the superintendence of trained chemists (mostly Germans), who receive about £25 per month. The Consul speaks of as many as 115 separate products being obtained from the Báku oil, and it is claimed that although its illuminating power does not equal that of American oil, the value of the residuum is greater.

* * *

In the same report it is mentioned incidentally, that in the year 1858 the Russian Government farmed the monopoly of salt and naphtha at Báku for £300 a year, whilst it is estimated that the yield of oil alone last year brought the pit-owners and refiners a clear profit of £500,000.

Some time since reference was made in "The Month" to the "extra strong essential oils," which Mr. Heansel, of Pirna, prepares by fractional distillation, and which he claims to consist of the finest and most aromatic parts of the ordinary oil. These oils have given rise to a law suit in the United States, the customs officials having insisted upon collecting a duty of 50 per cent. *ad valorem* upon them, as artificial oils, instead of 50 cents per lb., the duty leviable upon essential oils. The sum in dispute was about one thousand dollars, and judgment was given against the customs authorities.

* * *

The *Tropical Agriculturist* states that a beetle which infests *Cinchona succirubra* trees in Ceylon that have been "shaved" has been identified as the male of a species of *Lucanus*, greatly resembling the common European stag beetle. The insect appears to pierce the new bark and feed upon the resinous juice which exudes through the wound.

* * *

The results of some agricultural experiments made on the Shevaroy Hills have been communicated to the *Madras Times*, from which it appears that a plot of ground 22½ by 32 feet planted with *Maranta arundinacea* produced 430 lbs. of corms, yielding 65 lbs. of "arrow root;" and another plot, 29 by 43 feet, planted with 145 plants of *Jatropha Manihot*, produced 255 lbs. of roots yielding 30 lbs. of tapioca.

* * *

According to the *St. Louis Druggist*, an Illinois "doctor," having sent a bottle to a patient labelled "Calmel—pizen," has been cited to appear before the County Medical Society to show cause why he should not be expelled.

* * *

The present arrangements for the Friday evening discourses at the Royal Institution include the following subjects:—April 20, "The Island of Socotra and its Recent Revelations," by Professor Bayley Balfour; April 27, "Some of the Questions involved in Solar Physics," by Dr. C. W. Siemens; May 4, "Weather Knowledge in 1883," by Mr. Robert H. Scott; May 11, "Oysters and the Oyster Question," by Professsor Huxley; May 25, "Whales, Present and Past, and their Probable Origin," by Professor Flower; and June 8, a discourse by Professor Dewar.

* * *

On Tuesday next, at the Royal Institution, Professor J. G. McKendrick will commence a course of ten lectures on "Physiological Discovery," in which the progress of physiological research will be traced from the beginning of the sixteenth century, with the aim of showing how physiology has attempted to solve some of its problems by the methods of physics and chemistry and has thus become a branch of experimental science.

* * *

At the meeting of the Chemical Society, on Thursday next, April 5, a paper will be read on "The Elimination of Hydrogen Sulphide and Carbonic Anhydride in Coal Gas," by Mr. Lewis Wright.

* * *

On Tuesday next, April 3, at 8.30, Mr. R. W. Giles will read a paper on "Pharmaceutical Politics," before the Chemists' Assistants' Association, at the rooms, University Chambers, Conduit Street.

Transactions of the Pharmaceutical Society.

NORTH BRITISH BRANCH.

EVENING MEETING.

The fifth meeting of the present session was held in the rooms of the Society, George Street, Edinburgh, on Wednesday, March 14, at 9 p.m.

Mr. Alexander Napier, President of the Branch, in the chair.

The minutes of the former meeting were read and confirmed.

The following donations to the museum were then intimated:—

Specimen of Fresh Bael Fruit.
From Messrs. W. and F. Fergusson, Liverpool.

Hyracium (large piece.)
From Mr. Alexander Cleghorn, Cape Town.

Fine Crystals of Piperin.
From Messrs. T. and H. Smith and Co., Edinburgh.

Cinnamic Acid, prepared from Tolu Balsam.
From Mr. D. Gorrie, Edinburgh.

Specimens of Malted and Unmalted Grain, and of Impure and Rectified Spirit.
From Mr. James McGlashan, Edinburgh.

Specimens illustrating Pyrites roasting and the manufacture of Sulphuric Acid.
From Mr. John R. Hill, Edinburgh.

Pure Chloral. From Mr. William Pirie, Edinburgh.

The Secretary of the Branch having made a few remarks on the specimens, the President moved a vote of thanks to the donors, which was cordially responded to.

The Secretary then read a—

Descriptive Note of a New Hot-air Chamber Suitable for Pharmaceutical Purposes.

BY THOMAS MABEN.

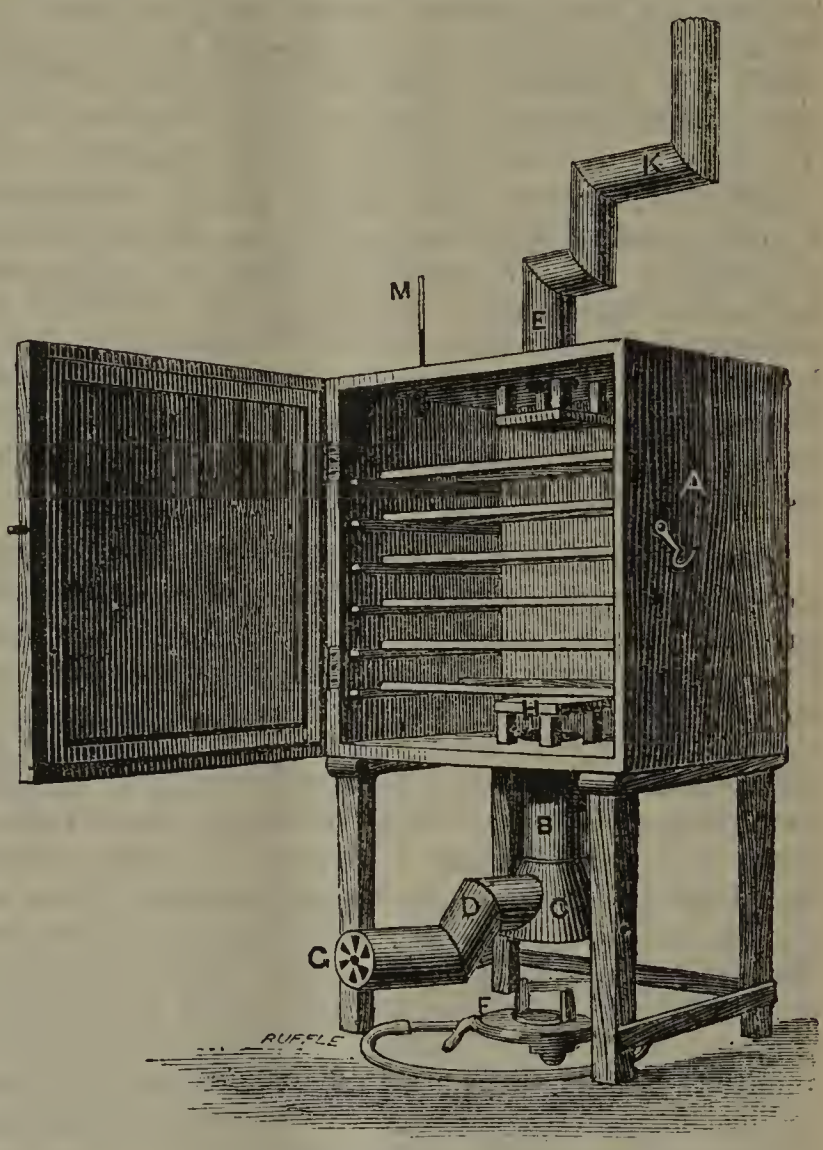
The ordinary steam or hot-air chambers for laboratory use, although meeting the most of the requirements for which they are designed, have the disadvantage of being more adapted for experimental than manufacturing purposes, and are, moreover, of such a price as to exclude their use in small pharmacies. The want of a cheap and convenient apparatus has induced me to bring under your notice the one on the table. I may remark that the design is due to Mr. Hislop, one of my apprentices, who intended it for drying photographic gelatine plates, but by slight modifications of the interior I find it perfectly adapted for the purposes of my own laboratory.

The chamber consists of a strong wooden box (A), 18 inches high by 18 inches wide, and 14 inches deep. To the front a door is attached, hinged in this instance, but a vertical sliding movement would be more convenient. To the two sides of the box are fixed wooden supports which serve to receive teak spars for supporting drying trays or evaporating dishes. The bottom of the box has a perforation of 3 inches diameter into which a zinc cylinder (B) is securely fitted and to this is soldered the upper end of a copper cone (C) with a flat bottom, while into this latter a bent tube (D), diameter $2\frac{1}{2}$ inches, and 9 inches total length, is securely inserted in the manner shown. A corresponding perforation is made in the top for receiving a tube to answer the purposes of a chimney.

Using a Bunsen burner or a spirit lamp as the source of heat, the flame is directed to the bottom of the cone (C) with the result that the heated air ascends into the chamber, being diffused by means of a dispersion board (H) about 4 inches square, which is placed over the orifice. At the end of the tube (D) there is fitted a "hit and miss" regulator (G), which consists of a series of triangle-shaped holes with a revolving disc behind so that the size of the apertures can be increased or diminished, thus enabling the amount of air entering to be under partial control. The highest temperature to which the air in the chamber has been raised is 180° F., which is sufficiently high for most pharmaceutical operations. If a uniform temperature of say 100° F. be required, the admission of air must be regulated accordingly by means of the regulator (G), accuracy being ensured by the insertion of a thermometer (M) into a perforated cork fitted into a half-inch aperture on the top of the chamber. By this means there is no difficulty in keeping within 2·5 degrees less or more of the desired temperature.

If a rapid current of warm air is desired, this can be had by placing an angular tube (K) on the top of the chimney (E), and by heating the angle of the tube a draught is quickly created.

It is desirable in some cases to filter the admitted air; this can be done by stretching a piece of lint or other suitable material between the regulator (G) and the tube (D) by which means dust particles are effectually excluded.



Maben's Hot-Air Chamber.

The metal parts of the apparatus being made to screw off and on, they can be detached at will, so that we can thus have a series of wooden chambers suited to different purposes. In this instance, the chamber being intended for drying gelatine plates, it was of course constructed so that the light would be effectually shut out, but it is obvious that a small glass window would add greatly to its value for laboratory purposes.

The advantages of this chamber are its simplicity, its perfect security against over heating and its small cost,—it can be made for a few shillings. It is light and easily handled and is always ready for work, a current of pure hot air being obtained in a very few minutes after the application of the Bunsen flame.

I find it specially adaptable in the preparation of granular and scale compounds, for drying precipitates, hardening pills previous to coating, and in other operations requiring a current of hot air.

The President in moving a vote of thanks to Mr.

Maben, for bringing the design under the notice of the meeting, said that the chamber seemed to be well adapted to the purposes for which it was intended. It was certainly very commodious, and the readiness with which it could be rendered available for use was a strong argument in its favour.

Mr. Gilmour supported the motion. He did not think that the chamber would be suitable for all purposes for which such apparatus was required, but when a current of hot air was desired it certainly would give that very readily. Several remarks regarding the apparatus having been replied to, a paper was read on—

"ACETIC ETHER: ITS TRADE COMPOSITION, MANUFACTURE AND SPECIFIC GRAVITY."

BY WILLIAM INGLIS CLARK, D.SC.

The paper was printed in last week's issue, p. 777.

Upon proceeding to read the paper the author asked the indulgence of the meeting for presenting a communication of so great length and so much complexity on an article which could scarcely be said to be in common use. The subject had grown in his hands, and he preferred to detail the various steps taken, so that the audience might follow the line of argument, and this he hoped to make more clear by reference to the series of diagrams which had been prepared for him.

The President of the Branch in returning the thanks of the meeting to the author of the paper said that the investigations detailed were beyond all praise as mere investigations in themselves, while the communication was an example of thoroughness of work which would not be lost on young investigators. The substance was not extensively used in medicine, but it had been proposed as a solvent in the preparation of certain alkaloids; for this reason it was desirable that the commercial articles should be as pure as possible, and, moreover, it was highly necessary that the pharmacopœial formula should be accurate: this it did not appear to be so far as the purification was concerned. On this point he might remark that magnesia had been recommended as a desiccator, and he might ask Dr. Clark if he had any experience of its use.

Dr. Clark: Magnesia is open to the same objections as caustic lime.

Continuing, the President said that he was sure that the meeting would join with him in admiration of the manner in which the subject had been presented to them.

Mr. Gilmour said that he had great pleasure in seconding the vote of thanks. Owing to the lateness of the hour he would not venture upon any detailed comment on the subject, but he might remark that he was not prepared to find so much and so serious variation in the commercial article as had been pointed out. A more serious matter was the unsatisfactory product obtained by the Pharmacopœia process; if there were an official process at all it certainly should be a perfect process. On this point future compilers should be careful to ensure correctness, and Dr. Clark's work would favour this greatly.

Mr. Dott said, that on the spur of the moment, he would not attempt anything like a complete criticism of such an exhaustive paper. There were one or two points which were referred to, which brought to his recollection something connected with his own work two or three years ago. At that time he was engaged in the same work, and he remembered that he found the gravity given in some text books to be quite different from anything he could prepare, which as far as he could recollect was very near ·900. Regarding the use of chloride of calcium as a dehydrating agent, it ought of course to be neutral, that was to say, the granular and not the fused salt should be used. With reference to the greater solubility of ethyl acetate in water at zero than at 15° C., and the reverse in the case of water in ethyl acetate, it was not really understood why it should be so; water had a greater attraction for itself at a low temperature than at a higher, while the reverse was the case with acetic ether. Probably this would explain the circumstance. He might ask Dr. Clark if anhydrous sulphate of copper would not have been admissible in getting rid of the water from the acetic ether.

Mr. MacEwan then said that the presence of water in commercial acetic ether was easily detected, and in most cases indicated the presence of impurity; but of course a sample containing only alcohol might be very impure and yet contain no water. However it was apparent from Dr Clark's statements that in most cases water was present, and there was a ready means of detecting its presence in anhydrous copper sulphate, which became blue when hydrated, while carbonate of potash shaken up with a portion of a suspected sample would become pasty or syrupy according as the quantity was small or great. Hitherto some reliance had been placed on the specific gravity of the compound, and should a sample be within a few units of ·900 it was considered a fair sample; but Dr Clark stated that this was not at all a reliable basis. Now on that point as well as on others which had been treated, there was at least one pharmacist, Mr. Umney, who had made investigations and got results differing somewhat from Dr. Clark's. Mr. Umney's results were given in an article on the Pharmacopœia "Additions;" in it he stated that the official process was satisfactory, and in a subsequent discussion recommended purification with chloride of calcium and free alkali, the resulting product having a lower specific gravity than that given by Dr. Clark. Knowing the important work which had been done by Mr. Umney, he (the speaker) would like to ask Dr. Clark if he had read Mr. Umney's paper, and if so, it would be satisfactory to hear from him any comment he had to make thereon.

Mr. Young said that he did not rise to criticize the excellent paper to which they had all listened, he was sure, with pleasure. Acetic ether was not an article of great importance, but it might be by-and-by. It was a curious circumstance that recent investigators had differed so much, and this would lead him to expect that Dr. Clark's paper would not be allowed to pass without outside criticism, which he felt that he (the author) would be perfectly prepared to meet.

Mr. Stephenson said that he was unwilling to let the discussion close without supporting what had been said regarding the merit of the paper. On one point he differed from Dr. Clark, namely in the "parts" of sulphuric acid and alcohol being taken by measure. Probably, the writer of the formula had the continental system in his mind's eye when writing the vague formula; however that might be, if the sulphuric acid were taken by weight, it would very nearly approach the theoretical quantity stated in the "model formula."

Mr. Gorrie having made some remarks regarding the specific heat of acetic ether, and several questions having been asked—

Dr. Clark said, in reply, that many of the points which had been referred to were already fully treated in the paper, so that he would only refer to the more important objections and statements. With reference to Mr. Dott's remark, regarding the use of chloride of calcium, he had no doubt that the use of the neutral salt would obviate decomposition of the ethyl acetate; but there was still the fact remaining that the salt absorbs more than one-half of the ether, so that no advantage was to be gained by its use. He then repeated his remarks on the use of anhydrous copper sulphate as a dehydrating agent and afterwards answered Mr. Stephenson's remarks on the meaning of "parts" in the Pharmacopœia directions. (See postscript). Reference had been made to Mr. Umney's paper on "Acetic Ether." He had read the article, and regarding the statements contained therein he had to say that if the parts in the B.P. were all to be taken by weight, then Mr. Umney's statement that the process was satisfactory could not be gainsayed, and it seemed probable that Mr. Umney had adopted this view. He (the speaker) had already shown that if a different interpretation of

the B.P. were taken then the process was utterly faulty. Mr. Umney only took exception to the B.P. process because it did not include rectification over carbonated alkali, or some provision for neutralizing the free acid, and he suspected that a sample rectified in the B.P. manner would contain much acetic acid. In the subsequent discussion he (Mr. Umney) again referred to this, but in his (Dr. Clark's) own experiments the pure acetic acid (after treatment with calcium chloride) only amounted to 1·56 per cent, not a large quantity but one which he quite agreed should be removed. The main objection, namely, the enormous loss, was never referred to in the aforesaid discussion. Mr. Umney had said that the more anhydrous the materials the better the yield. This was certainly the case as far as the acetate of soda was concerned, but Putullo and others have shown that a little water rather assists in etherification, and he (Dr. Clark) had already shown that absolute alcohol is unnecessary. He did not think that the boiling point could be used as a certain indication of purity, since alcohol and water raised it. The sample prepared by himself (99·7 per cent. ethyl acetate) boiled at 74·3–74·80 C. with barometer about 29·7 inches.

Mr. Gilmour here remarked that Mr. Williams, as well as Mr. Umney, had experimented with acetic ether and found the specific gravity to be ·880. Considering the care which Mr. Williams had always shown in his work, he thought that some regard should be shown for his results.

Dr. Clark, continuing, said that on the specific gravity he could place no reliance, for, although he believed the pure article, on the ground previously given, to be sp. gr. ·9004 to ·9012 at 60° F., it was no proof of purity that a sample agreed with this. It must be remembered that a mere mixture of alcohol and water could be made to give the same specific gravity. If the boiling point remained practically constant, if the specific gravity were about ·901, and, on analysis, the liquid contained 99 per cent. of ethyl acetate, then, he thought, some reliance might be placed on the sample; but Messrs. Williams and Umney did not publish any such statements; on the contrary Mr. Umney prepared his sample, which he considered to be very nearly pure, sp. gr. ·8956, by digestion with chloride of calcium and a small quantity of caustic lime, the latter would undoubtedly cause decomposition. Mr. Williams, on the other hand, believed ·890 to be correct.

The President then closed the discussion, and the meeting adjourned.

Provincial Transactions.

EDINBURGH CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

The tenth meeting of this Association was held in the Pharmaceutical Society's rooms, on the evening of the 21st instant. Mr. Peter Boa, President, in the chair.

The minutes of the previous meeting having been read and confirmed, the President called upon Mr. W. Scott Turnbull, to read a paper on the "Alimentary Canal."

The author began by giving a brief outline of the course and structure of the alimentary canal and the position occupied by the various organs in connection with it. He then took up the consideration of these organs separately so as to bring out clearly the several processes of digestion and described the constituents of saliva, gastric, pancreatic, and intestinal juices, and bile, the action of these upon amyloids, fats and proteids being shown. He then entered into the consideration of the pharmaceutical aspect of the subject, alluding to the artificially prepared digestive fluids and their method of preparation; thus the methods for preparing vinum pepsinæ, liquor pepticus, liquor pancreaticus, pepsin, and other medicaments of a like nature were given and the extent of their action discussed. Finally he showed how the digested food is carried into the blood circulation, and how the various kinds of food influence the growth of the body.

The paper was a highly interesting one and was well received by a good audience, and on the motion of the President a hearty vote of thanks was accorded to Mr. Turnbull.

A discussion followed the reading of the paper.

Thereafter, Mr. Turnbull initiated a discussion on the motion of which he had given notice at the previous meeting, held on March 7, and already printed in this Journal. In a short speech he endeavoured to prove that a universal title is desirable for all who carry on the practice of pharmacy; this title he thought should be "Pharmaceutical Chemist" as being the most appropriate, while those who had already acquired that title by examination should receive a purely honorary title, showing that it was one of distinction.

Mr. J. D. Robertson seconded the motion.

Mr. Peter MacEwan then proposed as an amendment, the following counter-resolution:—"Resolved that this Association give its cordial support to the Pharmacy Acts Amendment Bill, and in the event of the measure being enacted, respectfully urge the Council of the Pharmaceutical Society to make provision whereby the present Major examination may be continued for a reasonable time after 1886, so that those who may at that time be qualified by the Minor examination may have an opportunity of becoming pharmaceutical chemists if they so desire."

Mr. Robertson objected to the counter-resolution as not being a direct amendment to the motion; but the President ruled that the amendment was in order.

Mr. MacEwan then replied to the remarks of Messrs. Turnbull and Robertson and showed how the counter-resolution would meet any apparent hardships which might arise.

Mr. John R. Hill seconded the amendment and criticized the unjust principle of the motion; and he was supported by Messrs. Adamson, Aitkin, Crowden and Henry.

Mr. Turnbull having replied, the amendment was put to the meeting when 16 voted for it. Three afterwards voted for the motion. The counter-resolution was therefore adopted.

The President then intimated that the last scientific meeting of the session would be held on March 28, when a paper on "Photography—Dry Process," would be read by Mr. William Aitkin.

NOTTINGHAM AND NOTTS CHEMISTS' ASSOCIATION.

The usual monthly meeting was held on Wednesday evening, March 21, at the George Hotel, when opportunity was taken to present a handsome testimonial to the President, Mr. R. Fitzhugh, consisting of a case of silver dessert knives and forks, a liquor stand, and a beautifully illuminated address, which ran as follows:—"Presented to Richard Fitzhugh, F.C.S., by the members of the Nottingham and Notts Chemists' Association, together with a liquor stand and a case of dessert knives and forks, as a mark of the high personal esteem and respect in which he is held by them, and in recognition of his energetic and valuable services to the Association since its foundation, during which time he has successively filled the offices of Hon. Secretary, Vice-President, and for seven years that of President, with unvarying courtesy and kindness. They sincerely hope he may be blessed with happiness and prosperity, and that he may for many years continue to preside over the Association for which he has laboured so long and with so much success. Signed on behalf of the Association, Roberts Jackson, Vice-President; W. H. Parker, Treasurer; C. W. Warriner, Hon. Secretary."

The presentation was made by the Vice-President, who occupied the chair for the time, in a brief speech, in which he referred to the work done by the President,

and the esteem and respect in which he is held by the whole trade.

Mr. Fitzhugh responded in a feeling manner, thanking the members for their most unexpected and handsome present, and assuring them that the sight of it would be an incentive to greater personal interest and work, if it were possible.

The healths of the Vice-President, Treasurer, and Honorary Secretary were drunk, and the remainder of the evening was spent in a social manner.

Proceedings of Scientific Societies.

SOCIETY OF CHEMICAL INDUSTRY.

The Present Condition of the Soda Industry.

BY WALTER WELDON, F.R.S.

(*Concluded from page* 699.)

As regards the demand for free sulphur, the latest returns published by the Italian Government show that the average annual production of sulphur in Sicily and Italy, during the five years, 1875 to 1879 inclusive, was 282,000 tons, of which 216,000 tons were exported. The total quantity of sulphur that could be produced from English alkali-waste does not exceed two-thirds of this latter quantity. The world thus consumes much more sulphur than the English alkali-makers could produce, and although to sell all that they could produce they must drive much of the Sicilian sulphur out of the market, in the present "struggle for existence" somebody must go down, and English Leblanc soda-makers may be pardoned for preferring that it should be producers of Sicilian sulphur who have to do so, rather than themselves.

The actual cost of Sicilian sulphur, delivered at Marseilles,—transported in the cheapest way, in bulk, at the purchasers' risk,—is about £5 per ton. To become masters of the sulphur market, and at the same time to gain by recovered sulphur the required 2*s*. per cwt., English soda-makers must thus be able to recover sulphur at a cost not exceeding, say, about £2 per ton. They will hardly be able to do that at first, but I think that eventually they will be able to do it. If so, and if chlorine products should again command, as I think they will again command, a reasonable price,—for a price which scarcely pays their cost is, of course, not a reasonable price,—the Leblanc process will at least be able to hold its own, even without that other resource to which I have referred, and which I will now proceed to indicate.

There has come to me from Newcastle a very bold but, I venture to think, quite practical suggestion, the result of which can hardly fail to be of enormous importance, not only to the soda industry, but to almost all industries whatever. That suggestion is that the soda-maker should entirely cease to use raw coal as fuel, but should convert all his coal into coke, collecting for sale the oil and ammonia evolved during its conversion into coke, and himself using for heating purposes the gases evolved during the coking operation and the coke itself. It is believed that, in the Newcastle district at any rate, by this mode of proceeding the soda-maker would obtain his fuel virtually for nothing. In that district there is produced per annum some 2,000,000 of tons of very small coal or "duff," which is almost a waste product, and which, singularly enough, yields more oil than the more costly kinds of Newcastle coal, while at the same time yielding a very fair coke, sufficiently good, at any rate, for use in the furnaces of chemical works, especially when its combustion is assisted by that of the gases from the ovens in which the coke is produced; and the value of the oil and ammonia obtained when this "duff" is coked in ovens to which the Jameson system is applied is greater than the cost of the "duff," *plus* the cost of coking it. And it is probable that improved condensing arrangements will render the yield, if not of oil, at any rate of ammonia, so much greater than the yield hitherto actually realized as to enable the same result to be obtained in the case of ordinary steam coal, not only in the Newcastle district, but in the Lancashire district also. If so, the cost of producing Leblanc soda in both districts will be diminished by almost the total amount of the present cost of Leblanc soda for fuel. I say "almost," because, so far as one can see, the use of raw coal for "mixing" in the black-ash process must still be continued.

And it seems to me that this idea cannot but be as applicable to almost all other industries as to the soda industry: while the result to the material well-being of mankind of its general application, it is utterly beyond the power of any imagination adequately to conceive. This idea means, among other things, cheaper fuel for all purposes, an enormously increased supply of agricultural produce, and the entire suppression of smoke even in the busiest centres of industry. It means that manufacturing towns, by-and-by, shall no longer deserve such names as that which Mr. Matthew Arnold recently applied to St. Helens, and may even become tolerable in the sight of Mr. Ruskin.

And for my own part I venture to think that the same idea might be applied even to the fuel required for domestic purposes, rendering London absolutely free from smoke, and pea-soup fogs things only of tradition. I think that the time will come when our gasworks will be replaced, at least to a large extent, by establishments in which coal will be treated for the production of coke, illuminating oils, ammonia, and heating gases: the coke to be burnt in our domestic fire-places, the oils to be used for lighting the interiors of our houses, the ammonia to be employed in agriculture, to cheapen and render more abundant our supplies of food, and the gases to be burnt for raising steam for driving dynamos for lighting our streets by the electric arc.

Coming back to soda: if the suggestion in question will enable makers of Leblanc soda in certain districts to obtain their fuel for nothing, it will, of course, enable makers of ammonia soda, in similar districts, to do the same. How, then, will it help the Leblanc soda makers? While the quantity of fuel consumed in the ammonia process is only 150 per cent. on the soda produced, the quantity consumed in the Leblanc process is about 350 per cent. on the soda produced. This lower consumption of coal in the ammonia process than in the Leblanc process has hitherto been one of the chief advantages of the ammonia process; but fuel for nothing will so far convert this advantage into a disadvantage, that it will reduce the cost of ammonia soda per ton only by the cost of one and a half tons of fuel, while it will reduce the cost of Leblanc soda, per ton, by the cost of fully twice that quantity of fuel. No doubt, this result will be accompanied by some diminution in that heavy item in the cost of ammonia soda which is due to loss of ammonia; but still I think that the balance of advantage will be on the side of the Leblanc process. It can only fail to be so by reason of ammonia falling to one-half of its present price. The price of ammonia unquestionably will fall; but I think that increased use of ammonia in agriculture will prevent its price falling to anything like that extent.

Besides, then, being certain of getting his sulphur, by-and-by, at half its present price, the English Leblanc soda-maker has thus before him the proverbial "three courses": only, he must not choose between them, but must adopt them all. He must turn his hydrochloric acid to more uses than he does at present; he must recover and sell his sulphur; and he must distil most of his coal. He will then, I believe, be able, not only to hold his own against the ammonia process, but even to incline the balance in his favour.

It is said that "sweet are the uses of adversity;" and those uses, if not "sweet" in any ordinary sense, are at

least usually wholesome. One of the results of the conditions under which Leblanc soda-makers have had to work of late years has been to lead them to do their utmost to economize fuel and labour in all possible ways, and of the extent to which this has been done some figures which have been supplied to me by one our leading English manufacturers afford a striking example. They are figures for the ten years, 1872 to 1882. In 1872, in the work to which these figures refer, per 100 tons of total products manufactured, 336 tons of coals were consumed and £256 paid in wages; while in 1882, per 100 tons of total products manufactured, only 216 tons of coals were consumed, and only £144 paid in wages: the coal consumption in 1882 being thus only 64 per cent., and the wages in 1882 only 56 per cent., of what they were, upon the same quantity of total products, in 1872. How much more it may yet be possible to do in the way of economizing fuel, and in adopting labour-saving machinery, I cannot judge; but I venture to think that there are a number of little ways in which economies remain to be effected, and of these I will ask permission to give just one example.

I would venture to suggest that the English Leblanc soda-maker, who has taught the Continental Leblanc soda-maker so very much, might, in return, learn just one or two things from the latter. There can be no doubt that on the Continent, as a rule, and especially in Germany, the Leblanc soda-maker performs to a far less extent than the English Leblanc soda-maker usually does, that useless and costly series of operations which consists in buying salt, transforming it into sodium sulphate, converting that sodium sulphate into carbonate, then converting that carbonate back again into sulphate, and finally giving the sulphate away to his customers, and paying out of his own pocket for casks to put it in. Without entering on the question of the relative proportions of sodium sulphide in English and in German vat-liquors respectively, the ordinary English method of evaporating the vat-liquors and treating the resulting "salts" obviously involves losses of soda which the method of procedure now adopted by all the best German makers wholly avoids. In England, not invariably, but for the most part, the soda-liquors are evaporated by products of combustion passing over their surface, and the resulting "black salts," as they are called, are then "calcined" by products of combustion playing upon and through them. Alike during the evaporation of the liquors, and during the subsequent calcination of the "salts," SO_2 from the products of combustion is absorbed, with the ultimate result that an equivalent of what was soda in the liquors becomes in the final product sodium sulphate. How much soda is habitually lost in this way in England I do not know; but the only careful experiment on the subject with which I am acquainted brought out the loss due to this cause as over 2 per cent. I cannot think that it averages so much as that; but even if it averages only 1 per cent., it would be worth avoiding, providing that the cost of avoiding it were not greater than the value of the soda saved. The best German makers do now avoid all loss of soda from absorption of SO_2, and they believe that they gain other important advantages at the same time. They evaporate their soda liquors in pans heated from below; from these pans they fish by automatic mechanical means perfectly white salts; and then, instead of calcining these salts, either in contact with products of combustion or otherwise, they simply dry them in closed iron vessels heated externally, and now usually furnished with mechanical appliances for crushing the soda as it dries, and automatically feeding it into casks. They believe that by these means they effect an appreciable economy, not only of soda, but of fuel and labour too. The mechanical evaporating and fishing pan which they employ,—known, from the name of its inventor, as the Thelen pan,—has been adopted in one work in this country, by Messrs. J. C. Gamble and Sons, of St. Helens; but the Thelen apparatus for drying fished salts and delivering the products into casks has not yet been tried in this country at all.

Of course, the product obtained by merely drying fished salts has not the crystalline brilliancy of soda ash which has been calcined at a high temperature, and is, moreover, probably slightly more bulky that the latter. Bulkiness is objectionable, because it means more casks; but a preference for mere appearance, apart from actual quality, I think consumers could, if it were worth while, be easily educated out of. When the late Karl von Kulmitz founded the chemical works of Saarau, in Silesia, he did so with a view to supplying soda to the soap-makers of Breslau, who at that time were getting all their soda from England. The soda they were supplied with from England was very red, and the first soda made at Saarau was nice and white. When, however, samples of this white soda were sent to Breslau, the soap-makers there would have nothing to do with it. They said that to make good soap they must have *red* soda ash; and, for a time, Herr Kulmitz was obliged, in order to make his soda saleable, to mix with it a little oxide of iron. He managed after a while to educate his customers out of the habit of requiring that their soda should be red, just as some Continental makers of ammonia soda have had to educate many of their customers out of requiring that their soda should be very weak. A little similar education of some of the clients of some of the English Leblanc soda-makers might perhaps put an end to the irrational custom of the latter of adding salt to their soda after they have made it. They have to pay for that salt, they get nothing for it (the mixture being sold at so much per alkali metric degree), and it increases the cost of their product both for casks and for carriage. As in Lancashire, where this custom of reducing by salt chiefly prevails, a hundredweight of salt costs only about 5*d.*,—though extra cost for casks and carriage raise that 5*d.* to at least 1*s.*, or to fully 1 per cent. on the present selling price of 48 per cent. ash,—the matter may be considered too small to be worthy of mention; but in the alkali trade the present is a day of small things, when even pence per ton must be economized at every possible point, and when 1*s.* a ton may mean all the difference between an actual loss and a small profit. Moreover, it so happens that it is my lot nowadays to visit Continental alkali works much oftener than English alkali works, and when I have made a round among the former, and have found every foreign manufacturer whom I have visited eagerly intent, not only on economizing to the uttermost fuel, labour, and raw materials, but also upon making his soda as rich and as pure as possible, in order that it may compete with ammonia soda, and when I then, on getting home, write to an English alkali-maker to ask what a ton of soda now costs him, in order that I may compare his figures with figures which have been given me abroad, and on receipt of his figures I find that he charges each ton of soda with "1 cwt. of salt for reducing,"—while I know that in some sense or other it must be all right, since my friend of course knows his business very much better than I do, I nevertheless cannot help feeling that there is something here which is behind the times—I cannot help feeling that that ignorance on the part of the customer which makes dilution with salt all right for the moment is not going to last, and that if I were an alkali-maker I should do my best to become one of the first in the new state of things which is fast coming, by beginning at once to take such steps as I have seen Continental ammonia soda-makers take to persuade my customers to take my soda as rich as I make it, and not to require me to increase its cost by adding to it what is of no advantage to them.

Here the present paper might very well have ended, but I know that it is expected by some of the members present that I should say something on the present state of the sulphur recovery question; and I have, therefore, to ask permission to go on a little longer, in order to do so.

The question of the cost of sulphur recovery is one which I do not propose to go into, for the reason, among

others, that Mr. Alexander Chance will before long deal with that question before the Liverpool section of our Society. The experimental plant for the Schaffner and Helbig process which Messrs. Chance Brothers had in operation at their works at Oldbury this time last year, and which continued in operation till June or July, was then stopped, in order to the erection of a new plant, intended to deal with 300 tons of waste per week. This new plant has been recently got to work, and a little later on Mr. Alexander Chance intends to give at Liverpool a full account of its results, and especially of those of them bearing on the commercial aspect of the process. All I will say of it now, therefore, is, that into this new plant the Messrs. Chance have introduced several important improvements which greatly facilitate the working of the process, and that with the results yielded by it, so far, they are perfectly content.

In order to render intelligible some interesting results, relating in some degree to the commercial side of the Schaffner and Helbig process, which were obtained at Oldbury in the autumn, and which I have permission to report this evening, allow me to remind you that the two main operations of that process consist: firstly, in decomposing the calcium sulphide contained in alkali-waste by heating the waste with solution of magnesium chloride, whereby there is obtained, on the one hand, H_2S, and, on the other, solution of calcium chloride holding magnesium hydrate in suspension; and, secondly, in regenerating magnesium chloride for use again by treating that mixture of magnesium hydrate and solution of chloride of calcium by CO_2:—

First Operation.

$$CaS + MgCl_2 + 2H_2O = H_2S + CaCl_2 + MgH_2O_2.$$

Second Operation.

$$CaCl_2 + MgH_2O_2 + CO_2 = MgCl_2 + CaCO_3 + H_2O.$$

During the construction of their new plant, Messrs. Chance Brothers made a series of quantitative experiments, upon a scale of half a ton of waste per operation, mainly with a view to determining quantitatively the loss of magnesia involved in the process. These experiments were conducted by Mr. Frederick Chance,—a young member of the firm, who has only to fulfil the promise of his youth to take a very high rank among industrial chemists,—and their results are interesting and to a certain extent important. By making a number of successive operations without adding any fresh magnesia or magnesium chloride, and comparing the quantity of magnesium chloride which he had at the end of the series of operations with the quantity which he had at the beginning, Mr. Frederick Chance found that the average loss of magnesia corresponded to 1·05 parts of MgO per 100 parts of waste treated. Now, while in the waste produced at Oldbury there is no magnesia to speak of, a very pure limestone being used there for making black-ash, there is reason to believe that the waste produced in the Newcastle district,—the limestone of which district is all more or less magnesian,—contains fully enough magnesia to make up this amount of loss, without the addition of any magnesium compound specially for that purpose. All that should be needed, therefore, in the case of Newcastle waste, should be to add from time to time the quantity of calcium chloride necessary to convert into magnesium chloride, by the aid of CO_2, the magnesia actually existing in the waste itself. In other cases, the loss of magnesia in the Schaffner and Helbig process might be made up by replacing 2 or 3 per cent. of the limestone used for making black-ash by dolomite. This is supposing, of course, that the calcium carbonate recovered in the process is not used again in black-ash making. In proportion as this recovered carbonate can be used again for making black-ash, there will be no loss of magnesia, the magnesia "lost" in one operation coming round again in the next.

The experiments of Mr. Frederick Chance further brought out the important fact that the reaction by which magnesium chloride and calcium carbonate are recovered takes place,—at any rate under the conditions under which he operated, *i.e.*, under a pressure of 20 pounds per square inch,—quite as readily when the mixture treated by CO_2 is hot as when that mixture is cold. It has been supposed that that reaction depends upon the formation of bicarbonate of magnesia, in which case the mixture in question would have required to be cooled before being treated by CO_2, and so to cool it would have been at least troublesome. It seems, however, that the reaction in question is really a reaction between $CaCl_2$ and $MgCO_3$. This result is confirmed by the result obtained by Dr. Hewitt by simply mixing with solution of $CaCl_2$ an equivalent of the carbonate of magnesia of the shops. He obtained in that way a decomposition of about 80 per cent. of his calcium chloride, and it is probable that the carbonate of magnesia he employed did not contain more than that percentage of $MgCO_3$.

Mr. Frederick Chance further lighted upon a very curious fact, which is valuable as affording to the workmen a simple and ready indication of the moment at which the regeneration of the magnesium chloride has become complete. In the mixture operated upon there is always a little ferrous sulphide. This ferrous sulphide is not acted upon by CO_2 so long as there is any free magnesia present, but it is attacked so soon as all magnesia present has become carbonated, with the result of sending iron into solution as acid ferrous carbonate. The presence of the iron which thus comes into solution can be very readily detected, and the moment it appears the workmen in charge know that it is time to stop injecting CO_2.

In the South of France, experiments are now being made, at my instance, with a modification of the Schaffner and Helbig process. The first time I visited Cornwall, now very many years ago, I was on one occasion at a dinner-table at which I was asked to name "the four Cornish minerals." To name two of them was not difficult, but my endeavours to name the other two only created most Homeric laughter. At length I was informed that "the four Cornish minerals" are "fish, copper, potatoes, and tin." Cornwall being a mining county, for a Cornishman every natural production which he turns to useful account is a "mineral." At a banquet given by him at Giraud, in May last, to the members of the "Société de l'Industrie Minérale,"—the French "Iron and Steel Institute,"—M. Pechiney, addressing miners and metallurgists, similarly spoke of sea-water as "notre minérai à nous;" and the object of the modification in question is to turn to account in two ways one of the constituents of that extremely complex liquid ore, namely, its magnesium chloride. Most of those in France who make salt from sea-water content themselves with obtaining therefrom only common salt, but M. Pechiney treats the mother-liquors from which as much NaCl as possible has been crystallized out for the further obtainment from them of sodium sulphate, magnesium sulphate, and potassium chloride, and his final residue is a saturated solution of magnesium chloride, containing no other body except magnesium bromide. It has seemed to me that this magnesium chloride might be utilized at once for the recovery of sulphur from soda-waste, and as a source of magnesia for sale as such. When alkali-waste, however, is treated directly by solution of magnesium chloride, the magnesium hydrate, which is one of the products of the reaction which takes place, is obtained in admixture with all the numerous bodies other than calcium sulphide which were contained in the waste treated. When the magnesium hydrate is to be employed for the regeneration of magnesium chloride, this presence with it of foreign bodies does not matter; but in cases in which regeneration of the magnesium chloride used is not necessary, while it is desired to obtain magnesium hydrate for sale, the presence of foreign bodies with the magnesium hydrate must be avoided. I propose to avoid it by taking advantage of a reaction which is known as Kraushaar's, from its having been first published, in *Dingler's Journal* for 1877, by Dr. Kraushaar, of Thann, but which was really

first discovered by Mr. Helbig, at Aussig, and turned by him to practical account there as early as 1874. This is the reaction which takes place when alkali waste is heated with water under pressure. It is a reaction of two of water upon two of calcium sulphide, giving one of calcium hydrate and one of calcium sulphydrate. The calcium sulphydrate is obtained in solution, and if this solution be separated from the calcium hydrate and other bodies which it at first holds in suspension, on then running into it solution of magnesium chloride there is obtained, on the one hand, H_2S, and on the other, magnesium hydrate, almost chemically pure. And it is to be noted that, whereas when alkali-waste is treated directly with solution of magnesium chloride only one of H_2S is obtained for each equivalent of $MgCl_2$ which enters into reaction, by first getting the sulphur of the waste into the state of calcium sulphydrate two equivalents of H_2S are obtained for each equivalent of magnesium chloride decomposed.

At one time I had some hope that one might take advantage in England of this reaction of two of water upon two of waste, to the end of reducing by one-half the quantity of magnesium chloride to be employed, and consequently the quantity of that body to be recovered, per given quantity of alkali-waste treated. Mr. Chance was so obliging as to make some experiments on this point at Oldbury, and Mr. Helbig made others at Aussig, and the result of both series of experiments went to show that the idea is not applicable, or at any rate not applicable with any great advantage, when the magnesium chloride employed has to be regenerated. The reason is that the whole of the sulphur of the calcium sulphide of the waste which is heated with water under pressure does not come into solution unless a certain minimum quantity of water be used. This quantity of water is not too great to permit of the method being employed with advantage when the magnesium chloride has not to be recovered. But, when it has to be recovered, all this water would have afterwards to be driven off by evaporation, or the regenerated magnesium chloride would be impracticably dilute ; and the cost of this additional evaporation would probably balance the economy due to halving the quantity of magnesium chloride to be dealt with.

Some attention has been drawn recently to a second Austrian method of recovering sulphur from alkali-waste : a method proposed by Herr Opl, of the chemical works of Hruschau, in Moravia. This gentleman proposes to mix waste with water, to treat the mixture with CO_2 and so drive off H_2S from it, and then to pass this H_2S into more mixture of waste with water, in order that it shall be absorbed by the calcium sulphide of this second quantity of waste with formation of solution of calcium sulphydrate, which could then be treated in any one of several ways. This proposal seems to me defective, for the reason, among others, that I do not see how it would be practicable to avoid sending an excess of CO_2 into the second quantity of mixture of waste and water, which excess of CO_2 would react on some of the calcium sulphydrate formed in that second quantity of such mixture, driving off H_2S, and so occasioning both loss of sulphur and nuisance. Certainly, Herr Opl's method of getting the sulphur of alkali-waste into solution as calcium sulphydrate cannot, I think, compete with the simpler method of heating the waste with water under pressure.

Here, at last, I draw this too long paper to a close. I have had to show in it that the immediate future of the English Leblanc soda industry is somewhat gloomy ; but I trust that I have shown also reason to believe that sufficient attention to the complete utilization of all raw materials is yet capable of saving it. Very much has yet to be done before it will be placed once more on a satisfactory basis ; but *nil desperandum!* Patient courage and wisely-directed labour will bring all right again in time. A French Leblanc soda-maker, discussing in Paris, a few weeks ago, "l'affaire de Rio Tinto," spoke very hopelessly at first, but suddenly his countenance brightened, and he said "*Mais, courage!* This is not the first time, nor the second, since I have been in the trade, that we have been menaced with apparently unavoidable ruin ; but we have always pulled through before, and we will pull through again." That is a spirit on which we in England specially pride ourselves ; and in whatever "pluck," combined with intelligence, can do,—and in this case I believe that they can do all that is required, —I am confident that my countrymen will not be left behind.

Parliamentary and Law Proceedings.

The Pharmaceutical Society of Great Britain *v.* Lewin.

At the Stonehouse County Court, before S. S. Underhay, Esq., deputy judge, on Monday, March 19, the Council of the Pharmaceutical Society sued Mr. E. C. Lewin, carrying on business as a chemist, at Whimple Street, Plymouth, at the Stonehouse County Court, to recover two penalties of £5 each; first, for that he styled himself as "chemist" and carried on business as a chemist without having duly qualified himself; and, second, that not being a duly qualified person he sold a poison scheduled in the Act.

Mr. F. R. Stanbury (instructed by Messrs. Flux, Son and Co.) represented the Society.

The defendant did not appear.

Mr. Stanbury explained the nature of the action, and said Mr. Lewin's name did not appear on the Register of Chemists, which he produced, and which could be accepted as evidence by the Court. The defendant was well aware that he was infringing the law, because he had previously paid fines to the solicitors of the Pharmaceutical Society (Messrs. Flux, Son and Co.) for similar offences, and he (Mr. Stanbury) had served notice on Mr. Lewin to produce the letters he had received in relation thereto. Of course it was for the protection of the public that gentlemen who entered into business as chemists and dispensed drugs and poisons should thoroughly understand that business. On February 16, last, his (Mr. Stanbury's) clerk went to defendant's shop and purchased of him a packet marked "oxalic acid," the label on the paper in which the poison was wrapped was endorsed, "Poison.—Lewin, chemist." Oxalic acid was one of the poisons coming under the schedule, and it was mentioned in the Act referred to, that any person not duly qualified selling "oxalic acid" should be liable to a fine of £5. The Act went on to say further, that any person who exhibited or used the name or title of "chemist" and at the same time not being a duly registered person should be liable thereby to a penalty of £5. That defendant had infringed the law was plain as he had sold "oxalic acid" and had styled himself "chemist" having no authority to do so. When his (Mr. Stanbury's) clerk served a notice on defendant, he admitted that he had infringed the Act, but said that he hoped to have been able to set the matter right before it came into court.

Howard Stanley Walter, a clerk in Mr. Stanbury's employ, proved purchasing a packet of "oxalic acid" from defendant and handing it over that morning, unopened, to Mr. Codd, for analysis.

Mr. F. Codd, chemist, stated that he had analysed a portion of the contents of the packet produced, and proved it by four tests to be oxalic acid, a poison included in schedule 2 to the Act.

Mr. Stanbury: Mr. Codd is Local Secretary of the Pharmaceutical Society and I think it right to say that he knew nothing about this prosecution when the packet of poison was taken to him.

Robert Ellis, clerk to Mr. Stanbury, said he served notices on Mr. Lewin and asked him if he had received the letters, copies of which he showed him, relating to a

fine of £5 which he had already paid to the solicitors of the Pharmaceutical Society. Mr. Lewin admitted having received the letters.

Mr. Stanbury said, that as the case had been one that had entailed a certain amount of labour he asked his Honour to pass judgment with costs on the higher scale, as was allowable by the recent County Court Act.

His Honour gave judgment for the full amount of penalties, £10, with costs on the higher scale, £8 7*s.* 10*d.*

Poisoning by Prussic Acid.

An inquest was held at Christchurch, on Tuesday, March 13, before Mr. Druitt, Coroner, to inquire into the cause of the death of Mrs. Eliza Louisa Broadway.

According to the evidence of the husband the deceased had been in the habit of taking occasionally, before going to bed, some warm ale containing a few drops of laudanum and sal volatile. These preparations were contained in bottles usually kept in a cellaret, and in the same place was a bottle containing prussic acid which had been obtained for the purpose of poisoning a dog, but not used. The prussic acid was originally supplied in a bottle with three poison labels on it, but this having been broken deceased had placed it in another one, transferring to it one of the poison labels. On the previous night he had found his wife dead in bed by his side.

Dr. Henry W. Hartford deposed that just before Christmas he let Mr. Broadway have about 60 drops of Scheele's prussic acid to poison a dog the next morning. He wrote "Prussic Acid" on the bottle with a red "poison" label underneath it, put "poison" two or three times on the back, and gave him strict injunctions not to let it go out of his possession, and that he was to break the bottle as soon as he had used it. On the previous night Mr. Broadway came to his house and stated that he had found his wife lying dead in bed by his side; the room smelt of prussic acid, and that he feared that she had taken it in mistake for sal volatile, which she kept in the same place. Witness examined the place where the bottles were kept, and found four bottles in a division of the drawer, one contained about three teaspoonfuls of sal volatile; a small one was nearly full of laudanum; one labelled "prussic acid—poison" was empty; and there was one of olive oil. The opium and sal volatile were inside, and the oil and prussic acid outside.

As the result of a *post-mortem* examination medical evidence was given that deceased met her death through poisoning by prussic acid, and the jury returned an open verdict to that effect, and censured the husband for his carelessness in keeping so dangerous a poison.

Obituary.

RALPH DAVISON.

It is with great regret that we announce the death on Saturday last, the 24th inst., of Mr. Ralph Davison, Pharmaceutical Chemist, of Haysthorpe, Holgate Hill, York, in the 61st year of his age. Mr. Davison joined the Pharmaceutical Society in 1845, and for the last sixteen years has filled the post of Local Secretary, having continued his services in that office and as Local Superintendent of Examinations even after his retirement from business a few years ago. In 1881 Mr. Davison presided over the Local Committee which entertained the British Pharmaceutical Conference during its visit to York. During more than twenty years Mr. Davison held the position of Councillor in the city of York, and in this and many other ways rendered good and much appreciated service to his fellow citizens.

Notice has also been received of the death of the following:—

On the 2nd of February, Mr. James Rowell Rickard, Chemist and Druggist, Wadebridge, Cornwall. Aged 69 years.

On the 11th of March, Mr. Alfred Hodder, Pharmaceutical Chemist, High Street, Camden Town. Aged 42 years. Mr. Hodder had been a Member of the Pharmaceutical Society since 1864.

On the 15th of March, Mr. Ralph Robert Warrior, Chemist and Druggist, Edge Hill, Liverpool. Aged 55 years.

On the 16th of March, Mr. William Matthias Rackham, Chemist and Druggist, Upper Market, Norwich. Aged 51 years.

On the 26th of March, Mr. Francis Staveley, Chemist and Druggist, Park Lane, Liverpool. Aged 64 years.

Correspondence.

**** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Acetic Ether.

Sir,—It appears from the very able and complete investigation which Dr. W. Inglis Clark has made of the various processes which have been suggested for the production of acetic ether, as reported in your last number, that the process yielding the best result is that of the British Pharmacopœia. And this has been demonstrated notwithstanding the disadvantage resulting from larger proportions of sulphuric acid and acetate of soda having been used in the experiments than the Pharmacopœia process was intended to indicate.

I cannot understand how Dr. Clark could have inferred that the term "parts," when used in describing a process, without further explanation, should mean one thing as applied to a solid and another as applied to a liquid. The term is very commonly employed in describing chemical processes, and I have never seen it used otherwise than to represent parts by weight, unless accompanied by an explicit representation of its having a different meaning, as in the case of Squire's 'Companion to the Pharmacopœia,' where the explanation is given at the head of every page, clearly indicating what would be inferred in the absence of such explanation.

The postscript to Dr. Clark's paper seems to show that he had become sensible of having incorrectly interpreted the Pharmacopœia process, for he says:—"If we, however, calculate out the proportions as represented by weight as well as by measure, it seems probable that all the parts are intended to be taken by weight, and if this be so, the proportions in themselves are satisfactory enough."

The following figures will serve to show how well the proportions given in the Pharmacopœia accord with those which Dr. Clark has deduced theoretically and practically.

The theoretical quantities of the ingredients as given by Dr. Clark, if reduced to parts by weight, will be—

Rectified spirit	. . . . .	237·1 or 5	parts.
Sulphuric acid	. . . . .	423·8 ,, 8·9	,,
Sodium acetate	. . . . .	351·0 ,, 7·4	,,

Practically, however, it was found desirable to have excess, but not much excess, of sulphuric acid present, and the proportions suggested by Dr. Clark, when reduced to parts by weight, are as follows:—

Rectified spirit	. . . . .	237·1 or 5	parts.
Sulphuric acid	. . . . .	521·5 ,, 11	,,
Sodium acetate	. . . . .	351·0 ,, 7·4	,,

The Pharmacopœia proportions, similarly expressed, would be—

Rectified spirit	. . . . .	237·0 or 5	parts.
Sulphuric acid	. . . . .	474·0 ,, 10	,,
Sodium acetate	. . . . .	379·2 ,, 8	,,

As I had originally devoted considerable attention to this process, I should have been surprised to find that it required the alteration suggested, and, in fact, it will be found that the proportions indicated in the Pharmocopœia are all that can be desired, as also are the properties assigned to the finished product.

The value of Dr. Clark's paper will scarcely be lessened by withdrawing the requirement for any alteration of the simple and sufficiently exact statement of proportions in the Pharmacopœia process. The chief merit of the paper consists in the elaboration of important details relating to

the production of acetic ether, the determination of its right specific gravity and solubility in water, and the best means of purifying the first crude product of the Pharmacopœia process. With regard to the last-named object, the author has suggested a mode of operating which is obviously a great improvement upon that described in the Pharmacopœia.

T. Redwood.

Sir,—Ladies are said to put the most important part of their communications in the P.S., and as far as the British Pharmacopœia is concerned Dr. Clark seems to have followed their example.

That a gentleman of Dr. Clark's attainments should have made such an assumption as that the Pharmacopœia meant solids by weight, liquids by measure, seems to me most extraordinary.

I must protest against the assumption that such a method of stating formulæ (not physicians' prescriptions) is according to English usage. On the contrary, except in Squire's 'Companion,' I have, as far as my memory serves, seen it used only once.

In this case it was quoted as a "Pharmacopœial dictum" by a gentleman who recently read a paper before the North British Branch, where this heresy seems to have found a home. The B.P., on almost every page, refutes such a supposition, as far as it is concerned, by using the terms fluid drachm and fluid ounce; and even Squire's 'Companion,' although written for the use of medical men, prints the statement, "Solids by weight, liquids by measure," on every page, which, to my mind, is conclusive evidence (if such were required) that such a rendering of formulæ is not according to "English usage," but an exception requiring specially to be noted.

But, respecting Dr. Clark's valuable and exhaustive paper, it may be well to compare the quantities required by theory, the B.P. and Dr. Clark for the production of acetic ether:—

	Theory (roughly).	B.P.*	Clark.
Alcohol ·838	50	50	50
Dry acetate of soda . . .	74	80	62
Sulphuric acid, B.P. . . .	91	100	92

Now these three proportions are not so very dissimilar, and I have no doubt that all would produce a satisfactory result, although perhaps Dr. Clark's may be the best. The latter does not seem, however, to be remarkable so much for the excess of sulphuric acid as for the deficiency of acetate.

I have myself only worked with the theoretical proportions and have found no difficulty (using chloride of calcium and carbonate of potash for purification) in obtaining a product of a pretty constant composition, and one having the same specific gravity as that of the best makers, viz., about ·891.

A preparation of this gravity is evidently easily obtained, as many writers give figures very closely approximating to it. I have no doubt, however, after reading an account of Dr. Clark's very careful experiments, that he is right, and that a sample of ·890 specific gravity does contain a certain amount of alcohol or common ether.

Doubtless acetic acid is not a desirable impurity, but ethyl ether or even alcohol in small quantities are, I should imagine, harmless, and it would seem desirable to adopt a gravity which is easily attainable. Perhaps, however, Dr. Clark's process may be found to be worked with almost as great facility and constancy.

87, *Bold Road, Liverpool.* Alfred C. Abraham.

The Pharmacy Act Amendment Bill.

Sir,—Your article in last week's Journal calls our attention once again to the draft Pharmacy Bill. Without going fully into the merits or demerits of this proposed Bill, there is one part which strikes my mind as pre-eminently objectionable, and which it is to be hoped the trade at large will by no means quietly allow to pass into law. I refer to clauses 4 to 6, touching the penalties attached to the sale of patent or proprietary medicines, in the event of such containing a poison within the meaning of the Pharmacy Act, 1868.

In your remarks upon this point you state "That the chemist is not to be looked upon as selling, like the grocer or oilman, articles of whose nature he does not pretend to have any knowledge," etc., etc. Now, unfortunately, I must venture to differ from you in this assertion, so far as regards the sale of proprietary medicines sold as patents, and I think the experience of the trade at large will support the statement, that as a rule we are practically excluded from the possibility of knowing the contents of the majority of the nostrums with which the market is flooded under the protection of the patent medicine stamp; and yet by these clauses we are to be held responsible, and subject to penalties for not knowing that which the proprietors take every precaution against our knowing.

But again in clause 4, the name and address of the first seller is required. Who can be the first seller but the person by whom the preparation is actually made and sent forth into the market? Whereas clause 6 again throws the entire responsibility, with all the accompanying annoyances, upon the retail dealer, notwithstanding the possibility that the article may have previously passed through three or four intermediate hands. In the event of such becoming law, I can see no alternative other than the abandonment of the sale of all patents, unless we are prepared to risk the continual annoyance of actions, fines and visionary prospects of indemnification from unknown parties, possibly men of straw.

Another serious difficulty is one which comes home to our own preparations in common with others, viz.:—How far is it necessary or desirable to label every proprietary article "poison" in which a possible infinitesimally small dose of opium, morphia, etc., is introduced? That protection against the unguarded sale of poisons is desirable is not questioned, but whether the existing law, if properly carried out, together with an extension of the schedules of poisons, is not in itself sufficient, I think very doubtful.

Without going into other points which this Bill is supposed to remedy, but which I fear in practice will prove lamentably wanting, I would ask the Council to consider whether much difficulty might not be removed by, among other alterations, the addition of another clause requiring the registration of all proprietary preparations containing poisons, with the name and quantity of such poison contained in each bottle, box or packet. The number of such registration to be distinctly printed upon the labels, and outside the wrapper. And further, whether some scale might not be devised, beyond which alone it might be deemed necessary to require the poisons caution to be affixed.

I hope that some such material alterations may yet be introduced into the Bill.

Belgravia House, West Brighton. Edwin B. Vizer.

Weight.—According to section 45 of the Weights and Measures Act, a weight or measure duly stamped by an inspector under the Act is a legal weight or measure throughout the United Kingdom, unless found to be false or unjust, and is not liable to be restamped because used in any place other than that in which it was originally stamped.

D. M. L.—Such persons would stand in the same position as others who have not passed the Preliminary examination.

Herbalist.—(1) *Berberis Darwinii*, probably; (2) *Luzula sylvatica*; (3) *Dicranum majus*; (4) *Hypnum rutabulum*; (5) *Thuidium tamariscinum*; (6) *Lophocolea bidentata*.

B. R. is recommended to make his want known through the usual channel of advertisement.

Vinum.—Griffin's 'Chemical Testing of Wines and Spirits.' See a paper by Nessler and Barth, before, p. 43.

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J. R.—See a paper on the Testing of Olive Oil, by Mr. Conroy, *Pharm. Journal*, May 14, 1881, p. 933.

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* Evidently a free rendering of the theoretical requirement.

Communications, Letters, etc., have been received from Messrs. Clark, Baldock, Parker, Devonian, A.P.S., R.L.

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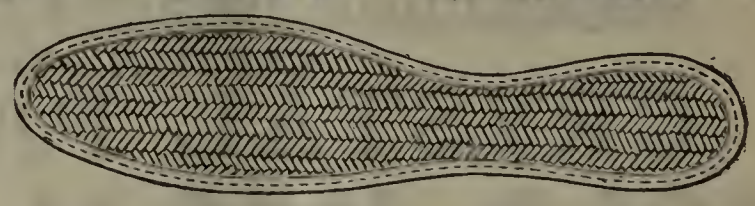

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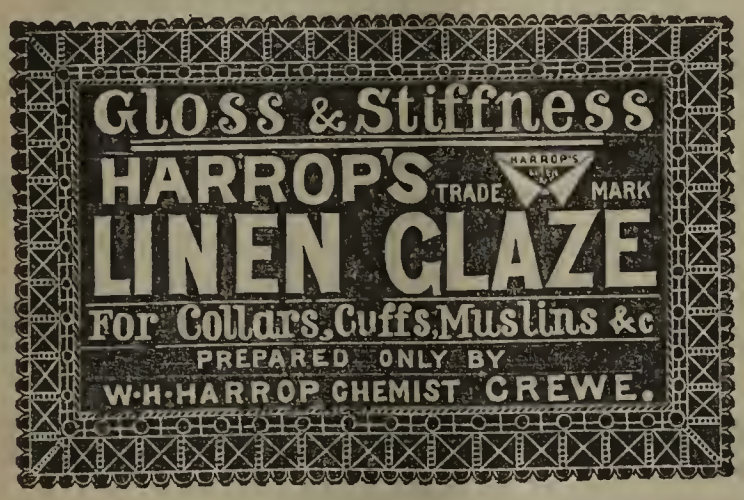

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India Office, 22nd March, 1883.

NOTICE is hereby given, that an Examination of Candidates for five appointments as Surgeon in Her Majesty's Indian Medical Service will be held in London in August, 1883.

Copies of the Regulations for the Examination, together with information regarding the Pay and Retiring Allowances, &c., of Indian Medical Officers, may be obtained on application at the Military Department, India Office, London, S.W.

A further notice will be issued when the exact date of the examination has been fixed.

ALLEN JOHNSON, Major-General,
Military Secretary.

PRIVATE TUTOR

Mr. JAS. W. SAUNDERS
(*From the Royal School of Mines*),
130, CAMDEN ROAD, N.W.

EIGHT of my Students presented themselves at the February Minor. **FIVE** passed. **PERSONAL TEACHING. NO DEMONSTRATORS.** Postal Instruction if required. Enclose stamp for particulars and terms; or "at home" daily from 1.30 to 2.30.

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FOURTEENTH SESSION, 1882-3.

Every bench in the Pharmaceutical Laboratories is engaged up to the April Examinations, and more than half until July. For the remaining places, Syllabus, &c., apply to W. BAXTER, Secretary.

The Middlesex Hospital Medical School. SUMMER SESSION, 1883.

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ENGAGEMENTS WANTED.

AS IMPROVER or JUNIOR. Age 20. 4½ years' experience. Nominal salary. Now disengaged. R. D. O., 8, Cunningham Rd., Page Green, Tottenham.

WANTED to recommend a young man, who has served 5 years' apprenticeship with a surgeon, to a situation with a Chemist and Druggist. A quick, neat and accurate Dispenser, and good character. Dr. TINLEY, Whitby.

AS ASSISTANT where more than one is kept. Age 22. 8 years' experience. Minor qualification. Out-door preferred. E. J. CAFFYN, High St., Crawley, Sussex.

AS JUNIOR or IMPROVER in a Mixed country trade. 6 years' experience. Age 19. Height 5ft. 9in. Good references. T. SKENTELBERY, Market St., Looe, Cornwall.

MANAGER of Branch. London or South Coast preferred. Age 30. Married. Registered Dentist. Minor qualification. A permanency required. K., 17, Canonbury St., Islington, N.

AS ASSISTANT in a good country or town business. Midlands or South preferred. Age 25. Height 5ft. 10in. Satisfactory references. Minor qualification. Disengaged. Please state business hours and salary given. A. H., 1, Brighton Rd., The Avenue, Southampton.

BY a gentleman of considerable experience and good references, a situation as MANAGER or SENIOR. Age 39. Particulars, stating salary, to A., care of Mr. Parkinson, Chemist, Atherstone.

AS ASSISTANT. London preferred. Age 22. 5½ years' experience. G. R. ELLISON, 31, Flowergate, Whitby, Yorks.

ENGAGEMENTS WANTED.

AS Junior ASSISTANT to Chemist or DISPENSER to Surgeon. Ætat. 22. Height 5ft. 9in. London or Midland Counties preferred. ALPHA, 6, Market Pl., Cambridge.

AS JUNIOR in first class Retail. Experience, 6½ years'. Age 25. Height 5ft. 9½in. Churchman. Disengaged. W. R., The Elms, Long Sutton, Lincs.

AS TEMPORARY. Well up in all branches. Town or country. Disengaged. Good references, &c. Salary moderate. E., 61, Parkholme Rd., Dalston Lane, E.

ASSISTANT, MANAGER, or TEMPORARY, or to put up stock. Thorough experience. Good counterman. 3 years' good reference. Now disengaged. Registered. OMEGA, 227, Mayall Rd., Herne Hill.

AS ASSISTANT, with morning free to attend lectures. In London. S.E. preferred. Minor and Hall. Satisfactory references. Age 22. H. A. W., 110, Newington Causeway, S.E.

AS ASSISTANT. Out-door preferred. In London. Age 23. 8 years' experience. Highest references. H. WRIGHT, care of Mr. Wright (formerly of Corbyn's), 66, Oakfield Rd., Anerley, S.E.

DRUG Trade.—AS TRAVELLER. E. J. T., care of Edwin R. Tookey, 409, Moseley Rd., Birmingham.

AS ASSISTANT. Accustomed to good class Retail and Dispensing business. Age 21. Height 5ft. 10in. First class references. Will send carte. JUVO, Mr. W. Rogers, St. Mary St., Weymouth.

LOCUM TENENS. Day, week, or month. Minor qualification. Now disengaged. Thoroughly conversant with Postal duties, not Telegraph. THETA, 4, Dagnall Park Villas, Selhurst Rd., South Norwood, S.E.

AS ASSISTANT in a good house of business. West-end preferred. First class references and experience. Age 26 years. Height 5ft. 10in. Disengaged. R. M., 35, South Molton St., W.

AS Temporary ASSISTANT or MANAGER. Many years experience in London and country. Disengaged. CHEMIST, Milton Villa, Shaftesbury Rd. East, Hammersmith, W.

AS JUNIOR. Accustomed to first-class business. Quick and accurate Dispenser. Height 5ft. 10in. Age 21. Good references. C. W. TURNER, 151, Broad St., Birmingham.

A FOREIGN appointment for a term of years, or a situation of trust at home. Advertiser is competent to take sole charge. Can be well recommended. Age 25. Minor qualification. A. L., Mr. Alderman, Messrs. Hill & Sons, 101, Southwark St., S.E.

EARLY in April.—By a German. London preferred. Speaks English. Age 24. C. B., care of Mr. Buchner, 124, High St., Whitechapel.

A SEASON engagement as DISPENSER or Counter ASSISTANT in fashionable watering place or inland summer resort. Highest references. Please state when required, salary, &c., to MISTURA, 3, High St., Wrexham.

AS Temporary ASSISTANT or LOCUM TENENS. In town or country. Minor qualification. Age 26. T. ASCOTT, care of Mr. Turner, Chemist, Whiteladies Gate, Clifton, Bristol.

TO APPRENTICE a gentlemanly well educated youth (16), tall and of good appearance, to a Chemist. In or near London preferred. Has passed Preliminary examination. Moderate premium. Must be comfortable home. Address, JNO. A. HUGHES, Antelope Hotel, Holywell, Flints.

AS ASSISTANT. Out-door. In good class Dispensing and Family Retail. In or near London preferred. Age 24. Highest references. H. C., care of Mr. W. Curtis, Royds Mill St., Attercliffe, Sheffield.

ENGAGEMENTS WANTED.

LOCUM TENENS, or to MANAGE Branch, with view to purchase after 12 months. References given. Registered. Experience town and country. Good Dispenser. HOLE, Westbury, Wilts.

MANAGER or ASSISTANT. Out-door. Qualified. Over 15 years' varied experience. Good Prescriber and can Extract Teeth. Married. No family. Full particulars to T. J., Mr. Morris, Chemist, Hereford.

AS ASSISTANT. In a good Dispensing business. 6 years' first-class country experience. Good reference. Disengaged first week in May. WM. BISHOP, 1, Duke St., Cardiff.

AS ASSISTANT to Chemist or DISPENSER to Surgeon. In London. Age 24. 10 years' good experience in large towns. Time for study in lieu of part salary. An abstainer. T. ROBERTS, 36, High St., Abingdon.

LOCUM TENENS.—W. C. TAYLOR, 68, St. Stephen's Avenue, (from Loftus Road), Shepherd's Bush, is open to an immediate engagement in town or country. Moderate terms and excellent references.

IN London.—By a young chemist, in his 21st year, a situation as IMPROVER in a good retail house, or would assist in a Laboratory. Has been 7 years engaged in Practical Pharmacy and Chemistry in the Laboratory of one of the largest retail houses in the kingdom, and has a fair knowledge of compounding. Best references as to steadiness and general character. Terms easy. Apply to Mr. POSTANS, 35, Baker St., W.

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LOCUM TENENS.—Mr. W. B. WEST, Staines Rd., Hounslow. 30 years' town and country experience, and unexceptionable references as Temporary Manager extending over the last 12 years.

TEMPORARY MANAGER.—A gentlemanly business man, accustomed to first-class retail (qualified), seeks an engagement to take charge during absence, &c. Satisfactory references. PHARMACY, 3, Bloomfield Ter., Paddington.

CHEMISTS and Dentists.—As JUNIOR. Can assist in the Surgery and workroom. Age 20. DENS, Mr. Bryant, Drummond Rd., Bristol.

ASSISTANTS WANTED.

A COMPETENT Senior ASSISTANT, who has been accustomed to a general country business. Must be a good Counterman. A liberal salary will be given. Apply, stating age, height and full particulars, to DUNHILL & STILES, Pharmaceutical Chemists, Doncaster.

A REGISTERED gentleman, about 30, to MANAGE a good business. Good Prescriber and able to Extract Teeth. Must be energetic and obliging. In or out. Also good JUNIOR, about 22. In-door. Address, with full particulars as to age, height, experience and references, M. P. S., 48, Brook Rd., Bootle.

A COMPETENT ASSISTANT. Must be a neat and accurate Dispenser and well up in the Retail. Age 24 to 30. In-doors. Personal interview desirable. MEACHER & HIGGINS, 105A, Crawford St., W.

ALFRED S. AMOORE, 173, Sloane St., S.W., has a vacancy for a Second ASSISTANT, about 22 years of age. Applicants writing will oblige by stating full particulars.

IMMEDIATELY.—A gentlemanly ASSISTANT. In-door. Accustomed to a first class trade. Must be qualified by examination. Age about 23. Three assistants kept. Apply, stating age, height, salary required and references, and enclosing carte (to be returned), to E. H. METCALFE, Malvern.

ASSISTANTS WANTED.

SENIOR ASSISTANT. Out-door. Must be a competent Counterman, as well as good Dispenser. Not under 25 years of age, nor 5ft. 7in. in height. Salary to commence at £100. Personal application only. HENRY J. DEACON, Beckenham, Kent.

MESSRS. ARGLES & STONHAM, Maidstone, have a vacancy for a Junior ASSISTANT. In-door. Not under 21 years of age. Must have passed the Preliminary. Applicants are requested to state full particulars.

IMMEDIATELY.—Junior ASSISTANT. In-doors. Not over 22. To give his whole time. Salary £35. Hours 8 to 10, with alternate Sunday duty. Apply personally, or with carte, to W. G. TAPLIN, 75, Hampstead Rd., London, N.W.

H. BARTON, Pharmaceutical Chemist, St. Ives, Hunts, requires an ASSISTANT. In-door. About 20 years of age. Accustomed to a country business. Applicants will please state usual particulars.

BY the 12th of April.—An experienced ASSISTANT, about 24 years of age. Must be a quick and accurate Dispenser. State height and salary required (enclosing carte) to COMMANS & WILSON, 11, George St., Bath.

A COMPETENT and reliable ASSISTANT, of active business habits. Thoroughly accustomed to a good counter Retail. Efficiency as a Salesman and Prescribe essential. An acceptable gentleman desirous of a permanency would receive £70 annually, in-doors. Apply personally, if possible, to RALPH HALL, 552, Kingsland Rd., N.E.

A COMPETENT ASSISTANT for a Dispensing and light Retail business in the country. Good references indispensable. A Junior of experience not objected to. Address, with full particulars and carte (to be returned), D., care of Mr. H. A. Thompson, 22, Worship St., Finsbury Sq., E.C.

A JUNIOR. Of good business ability and character. Accustomed to Mixed country trade and desiring a permanency. Time for study. Apply, stating references, age, experience and salary required (in-door), to A. PEAKE, Chemist & Dentist, Earlestown, Lancs.

MR. EDWARD J. EATON, Pharmaceutical Chemist, Woodbridge, Suffolk, requires a gentlemanly qualified ASSISTANT, about 21 to 25 years of age. Business, light Retail and Prescribing. Hours 8 to 7 o'clock. A comfortable home is offered to a suitable man. Send references, photo., and usual particulars.

ABOUT the 10th of April.—A competent ASSISTANT, for a Dispensing and light Retail business. Apply, with usual particulars, and if convenient, enclose carte (to be returned), to Messrs. LONG & STRICKLAND, Bognor-on-Sea, Sussex.

APPRENTICE.—Vacancy in a light Retail business for a gentlemanly youth. One who has passed the Preliminary preferred. Home comforts. Premium required. E. THOMPSON (late Elkington), Chemist by special appointment to the Queen, 1, King St., Dover.

AN ASSISTANT for a light Retail and Dispensing business, where one only is kept. Must be steady, active, and obliging. Time arranged for study if desired. Apply, stating age, references, and usual particulars, to ROBERT BAXTER, Pharmaceutical Chemist, Huntingdon.

IMMEDIATELY.—An ASSISTANT, not less than 22, who has been accustomed to a first-class Family and Dispensing business. Must be of gentlemanly appearance and good address. Apply with full particulars to C. H. GROSVENOR, Pharmaceutical Chemist, 24, Station Rd., Westgate-on-Sea, Kent.

A CHEMIST'S ASSISTANT, qualified, and desirous of working into the Dentistry. Advantageous terms to suitable young man. J. P., care of Barclay & Sons, Farringdon St., E.C.

ASSISTANTS WANTED.

APPRENTICE.—J. Stevens, Chemist, High St., Strood, Kent, has a vacancy for an educated youth as Apprentice. Comfortable home. Moderate premium.

COMPETENT Junior. Efficient to Dispense and willing to make himself generally useful. In a Mixed country business under a Manager. In-doors. Age, height, salary, references and usual particulars, to Twinberrow & Co., Chemists, Worcester. Applications not answered in a week declined.

A THOROUGHLY competent Senior Assistant. Qualified preferred. Of gentlemanly appearance and good address, and capable of taking management during absence of principal. Must be a reliable Dispenser, and accustomed to first-class Retail. Also a gentleman of good experience as Second Assistant. Apply personally, or if by letter, enclose carte, with full particulars, and state salary required, to E. C. Perks, 1, Sloane Sq., London.

IMMEDIATELY.—A respectable youth as Apprentice. A good opportunity for obtaining a thorough practical knowledge of his business. Moderate premium. L., care of Messrs. Hodgkinsons, Stead & Treacher, 198, Upper Whitecross St., E.C.

A SENIOR Dispensing Assistant, aged about 28, writing a good hand, and used to first-class trade. Particulars and carte to Jay, 48, Baker St., W.

DISPENSER.—The Guardians of the Poor of the Parish of St. Mary, Islington, require a Dispenser for their Dispensary at Liverpool Rd., in the said parish. The salary will be £99 per annum, with apartments, coals and gas. No person will be qualified to be appointed unless he shall be a Licentiate of the Apothecaries' Company of London, or shall have been duly registered under the Pharmacy Act, 1868, or some other authority of law in that behalf. Applications for the appointment on forms which can be obtained at the undermentioned offices, accompanied by not more than three original testimonials of recent date as to character and competency, must be sent to me on or before the morning of Wednesday, the 4th of April next. Personal canvassing of the Guardians will be held a disqualification.

By order, Edwin Davey, Clerk,
Guardians' Offices, St. John's Rd.,
Upper Holloway, N., 22nd March, 1883.

AN Assistant, about 25 years of age. Must be well up in Dispensing and Retail. Liberal salary to an experienced man. Personal application if possible; if not, write full particulars, enclosing carte (to be returned). W. Pinyon, Chemist, 49, Abbey Rd., St. John's Wood, N.W.

A JUNIOR Assistant for a Dispensing and light Retail business. Churchman preferred. Apply, stating age, height, salary required, reference, when disengaged, &c., to F. Sussum, 6, Market Pl., Cambridge. Photo. to be enclosed if possible.

A GOOD Dispenser and Bookkeeper, for a Surgeon. State age and salary required. S. Dunn, St. Austell, Cornwall.

A JUNIOR Assistant. In-door. One used to a Prescribing and Mixed business preferred. References from last situation. Apply, stating age, height, salary, when at liberty, with carte (to be returned), A. Worts, Chemist, Harwich, Essex.

ASSISTANT in Dispensing and light Retail. Age about 23. One only kept. Apply, stating usual particulars, and enclosing carte (to be returned), J. Barnitt, 86, The Parade, Leamington.

IN middle of April.—Manager. Thoroughly trustworthy, with unexceptional references. Permanency to good man, married. Can have the use of house and gas. State salary, &c. Apply, by letter only, R., 18, Hemer Ter. Bootle, near Liverpool.

ASSISTANTS WANTED.

A JUNIOR Assistant. Good address and able to Dispense. Apply, enclosing carte and stating age, height, experience, salary required and references, to T. Bailey, Chemist, Coventry.

CALCUTTA.—For a first-class firm, an experienced Assistant with Major qualification. Four years' agreement. Apply by letter only to Messrs. Alex. Laurie & Co., 14, St. Mary Axe, London, E.C.

AN Improver, for a Retail business. Time allowed for study, &c. References and full particulars to H. R. Adams, Chemist, Whitstable-on-Sea, Kent.

A JUNIOR, out-door, who wishes to fill up his time, when not attending lectures, &c., from about 2.30 to 8 p.m. Apply by letter, stating particulars, to T. H., 12, Canonbury Pl., Islington, N.

AT once.—Out-doors. Age about 25. A trustworthy Assistant (single) for Mixed business. Capable of Prescribing and Extracting Teeth, of thorough business habits, and a good Salesman. One seeking permanency preferred. Good references indispensable. Applications not answered in two days declined. Apply J. Wood, Chemist, Bridgehouses, Sheffield.

A JUNIOR Assistant. In-doors. He would be required to attend to Post Office duties. A quick clear-headed young man. Character indispensable. An abstainer preferred, who could Extract Teeth. State age, salary required, and give references, to John Gibson, Chemist, Chapeltown, near Sheffield.

AN in-door Assistant. Accustomed to good class Retail and Dispensing. Must produce satisfactory references. State age, height and usual particulars. Liberal salary to a suitable person. William Oldershaw, Dispensing Chemist, Market Pl., Nottingham.

A QUALIFIED Assistant for the West Indies. Apply by letter to W. I., care of Messrs J. H. Schrader & Co., 31, St. Mary Axe, E.C.

IMMEDIATELY.—A gentlemanly Junior or Improver, about 20 years of age, for a good Dispensing and light Retail business. Comfortable home. Time allowed for study if required. State age, height, salary required. Must have a good reference. Apply to J. M. Buck, Pharmaceutical Chemist, 179, Bedford St., Liverpool.

RANDALL & SON, Southampton, seek immediately a Junior Assistant, well grounded in Dispensing and general business. Good personal character. In house. State salary required, age, height, previous experience, &c.

AN Assistant. Accustomed to a good class Retail and Dispensing business. Age about 25. Qualified. Apply, with full particulars, to G. E. S., 3, Woodhill, Northampton.

AN able Assistant, for one of our firms in the East. Apply by letter to A. S. Watson & Co., 106, Fenchurch St., E.C.

JUNIOR or Improver. For a small light Retail, with surgeon's good Dispensing. Time for study could be arranged if required. Apply, stating salary, in or out-door, age, experience, &c., to Chemist, 195, Seven Sisters Rd., Finsbury Park, N.

ASSISTANT. Accustomed to Dispensing. Qualified preferred. Usual particulars to Messrs. Sharpe & Son, 34, High St., Notting Hill, London, W.

JUNIOR Assistant. One who has served a good apprenticeship. Highest reference as to character indispensable. Apply, stating full particulars, to H. Hyett Bailgate, Lincoln.

AN active out-door chemist's Assistant who knows his business. Salary 30s. per week. Apply Monday and Tuesday between 2 and 4, at 113, St. Martin's Lane, Trafalgar Sq. None need apply who cannot give reference of sobriety and honesty.

ASSISTANTS WANTED.

MESSRS. JOLLEY & CO. require a Junior Assistant. Must have had experience in a good Dispensing business and have passed the Minor examination. Apply at 13, Curzon St., Mayfair, W.

A COMPETENT Senior Assistant, about 25, with Minor qualification. Also a good Junior Assistant, accustomed to first-class Dispensing. About 22. Five others employed. Apply personally to W. Thomas, Chemist, 103, Talbot Rd, Westbourne Grove.

BELFAST.—Mr. Payne requires an out-door Assistant, about 23 years of age. Must be of gentlemanly appearance and good address. One having the Minor qualification, and accustomed to a good class light Retail and Dispensing business. State salary, age, and when disengaged. Oxford Buildings.

A VACANCY occurs for a gentlemanly young man as Assistant in a good class family business. One wishing to prepare for the examinations will have opportunities for study and assistance in preparation of his subjects. A personal interview indispensable. J. Dale, Pharmacist, 345, Park Rd., Liverpool.

ASSISTANT for a Dispensing and Retail business in the country. Two assistants kept. Apply, enclosing carte (to be returned), stating age, height, salary required, and references (which must be unexceptionable), to A. B., care of Messrs. Barclay and Sons, 95, Farringdon St., London.

APPRENTICE.—In the healthiest suburb of Liverpool. Exceptional opportunities for acquiring a thorough knowledge of the business. Premium moderate. Time allowed for study and assistance rendered. Ozone, care of Messrs. Evans, Sons and Co., Liverpool.

COMPETENT Dispensing Assistant. Apply, stating age, height, and previous engagements, to A. Duncan, The Square, Bournemouth.

AN Assistant, who has been accustomed to a good Family and Dispensing business and passed his Minor. Age about 24. Where three are kept. State experience and salary expected. Medical Hall, 168, Piccadilly, W.

AN out-door Assistant. Must be well up in Dispensing and a good Counter hand. Apply, with full references, enclosing carte de visite and stating salary required, to Gouldings, Cork.

A JUNIOR. One with some knowledge of Book-keeping preferred. Apply, Henry D. Simpson, Louth, Lincolnshire.

A JUNIOR Assistant, in-door, with good address. Age about 21 or 22. One accustomed to a good country business preferred. Apply, stating particulars and reference, to Iliffe & Sons, Pharmaceutical Chemists, Nuneaton, who also have a vacancy for an Apprentice.

BUSINESSES FOR DISPOSAL.

A GOOD class Business. In Hackney. Returning £500 per annum. Satisfactory reasons for selling. Long, valuable lease. No reasonable offer refused. Address, Alpha, Barron, Harveys & Co., Giltspur St., E.C. No agents.

ESTABLISHED 30 years. A ready money Business. In good thoroughfare. Returns £450, and increasing. Very profitable. Rent of house (4 rooms) and shop, plate-glass front, under £27. Price about £200. Apply, P. D. A., 15, Salem St., Sunderland.

SOUTH Wales.—Mixed country Retail, with good Prescribing and profitable Horse and Cattle Medicine connection. No paints or colours. Returns £2000. Price £750. This is an exceptionally cheap concern. Mr. Brett, Leicester.

BUSINESSES FOR DISPOSAL.

A GENUINE Retail and Prescribing Business, in a large manufacturing town near Leeds. Well fitted shop, and a good saleable stock. Trial and every investigation allowed. Private entrance to house. Returns over £500 a year. Price £360, or by valuation. Rent £35. Part purchase can remain. Address, Chemist, "Mercury" Office, Leeds.

MANCHESTER.—Corner Business, Retail and Prescribing. Main thoroughfare. Populous neighbourhood. Large premises. Established 40 years. Average returns under management £450. Could be much improved by a good Prescriber and Tooth Extractor giving personal attention. Cash price £200, or less to immediate purchaser. Address, T. Dean, Great Harwood, Lancashire.

IMMEDIATELY.—On account of ill-health. Bonâ fide Business, capable of increase. Unopposed. Pleasant and healthy situation. Surrey, within 10 miles of London. Post Office attached. Small house. 16 years of lease to run. For further particulars apply to Mr. Mandson, Post Office, Selhurst Rd., S.E.

IMMEDIATELY, for cash.—An old established light Retail and Dispensing Business, in one of the best positions in Liverpool. Returning on an average for the last 3 years, £1000. Capable of being doubled by an energetic principal. Good premises. Address, Zeta, Messrs. Barron, Harveys & Co., Giltspur St., E.C. No agents.

A SMALL old established Dispensing and Prescribing Business, in a large and increasing suburb of Liverpool. Will be sold cheap. Owner leaving England. No chemist or surgeon within half a mile. D., 31, Townsend Lane, Liverpool.

RE L. T. Goucher, of 265, Glossop Rd., Sheffield, Chemist and Druggist, and Wine and Spirit Merchant.—To be Sold by private treaty, the Stock-in-Trade, Fixtures, Fittings and Utensils of the above business. There is a Gilbey's Agency for sale of Wines and Spirits attached to the premises, also a lease of same, of which about 9 years are yet unexpired. The turnover has been upwards of £2000 per annum. For further particulars and to treat, apply to Camm & Corbidge, Chartered Accountants, Norfolk St., Sheffield.

SCOTLAND.—A Business. Immediately. In main thoroughfare of manufacturing and agricultural town in the east of Scotland. For full particulars apply to Messrs. Barron, Harveys & Co., Giltspur St., E.C.

RETAIL, Dispensing and Prescribing Business. In a large and rapidly increasing London suburb. Corner shop. Handsomely fitted. Excellent opening for the addition of Dentistry. Price £650. Address, H. W., care of Messrs. Edwards & Son, 157, Queen Victoria St., London, E.C.

SOUTH Wales.—In rapidly increasing town. Light Retail, Dispensing and Prescribing. Well established concern. Returns £1200. Price £1000. Dentistry could be added with advantage. Large shop and excellent house on lease. Mr. Brett, Valuer, Leicester.

SOUTH Coast.—Immediately. An old established and genuine Retail Business. Now returning £16 weekly, at full prices, and capable of being largely increased. Corner shop. Good dwelling house. Price about £200. This is the cheapest business in the market. Apply (personally preferred) to Mr. Hine Gilbert, 17, Hart St., Bloomsbury.

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The Pharmaceutical Journal AND Transactions.

THIRD SERIES, No. 667.] SATURDAY, APRIL 7, 1883. [PRICE FOURPENCE.

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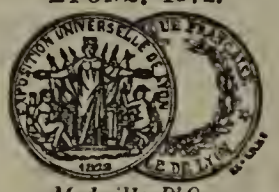
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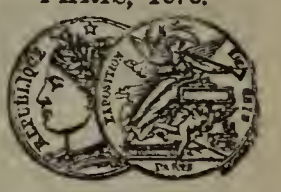
Medaille de Merit.



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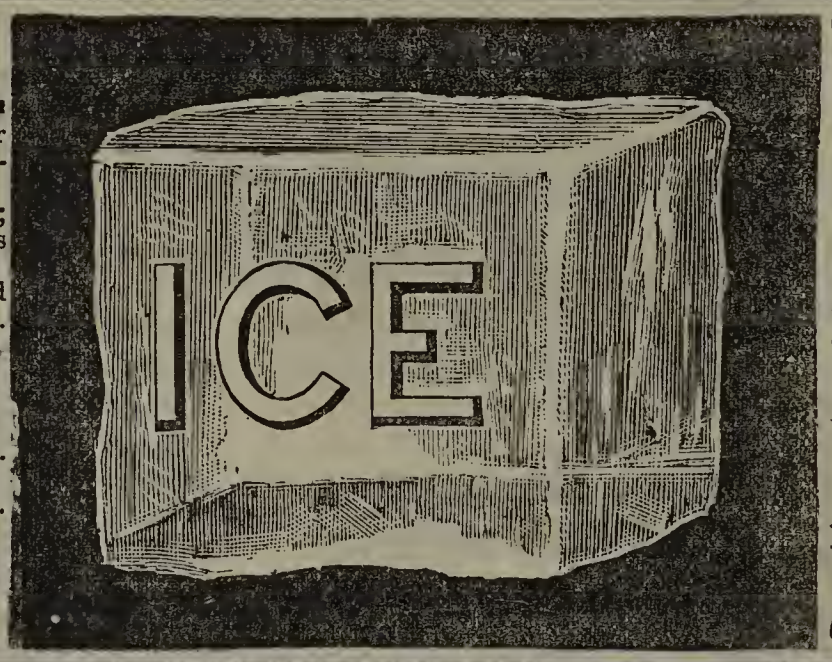

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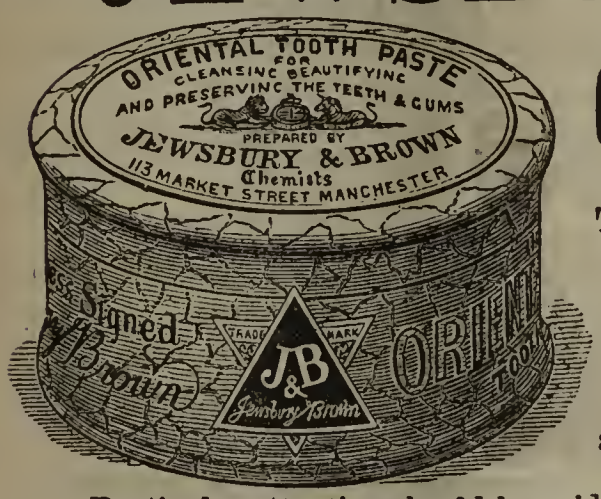

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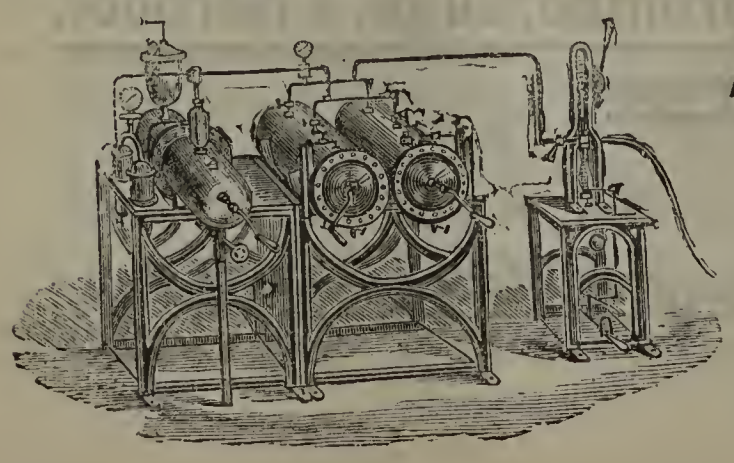

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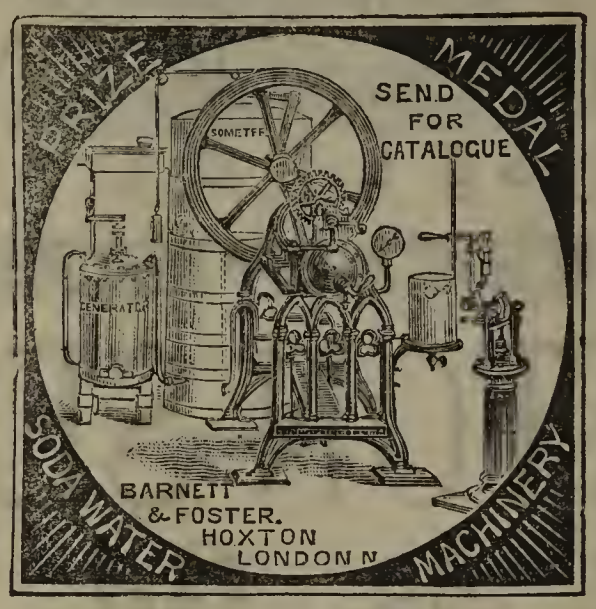

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From the LONDON MEDICAL RECORD, *December 15th*, 1879.

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For full Notes and Reports see front pages of *The Lancet*, May 6th.

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For wasting diseases.

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So combined, the oil is sub-divided into minute particles which can be seen under the microscope to be as fine as the granules of milk; and so much finer than any that can be obtained by any emulsion with gums. On the fineness of the emulsion depends the digestibility of the oil. "The digestive change undergone by fatty matters in the small intestine consists mainly in their reduction into a state of emulsion, or division into infinitely minute particles."

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Atropiæ Sulphas ....1-120 grain.	Atropiæ Sulphas ....1-150 grain.
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THE BITTER PRINCIPLE OF HYMENODICTYON EXCELSUM.*

BY W. A. H. NAYLOR.

The interest attaching to the two species of *Hymenodictyon*, viz., *H. excelsum* and *H. obovatum*, is derived from the circumstance that they both yield a bitter bark which is in common use among the natives of India as a tonic.

Surgeon-Major Dymock has remarked that the bark of *H. excelsum* is the more bitter of the two and is therefore probably the more valuable, although he is not aware that either of the barks has been properly tested in European practice.

As a remedy of repute it was invested with additional importance when it received a place among the non-official drugs of the Pharmacopœia of India for 1868. Referring to the species *H. excelsum* it is there stated that the "inner coat of the bark, according to Roxburgh, possesses the bitterness and astringency of cinchona. . . . The outer light spongy layer of the bark is comparatively tasteless. Considering the natural order to which the tree belongs and the sensible properties of its bark, it is not improbable that it may prove a valuable remedy. In all future inquiries into the subject of Indian antiperiodics this bark should be one of the first to which attention should be directed." The success which attended its use as a native febrifuge probably gave rise to the supposition that its medicinal properties were due to the presence of quinine. Consequently, in 1870, Mr. Broughton, who was at that time the Government Quinologist at the Ootacamund plantations, submitted to an examination the *fresh* bark of the tree. He found that the bitter taste was due to the existence of *æsculin*, and that the bark when dry was almost tasteless owing to its transformation into *æsculetin*, the decomposition having been induced by contact with decaying organic matter.

Through the kind services of Mr. E. M. Holmes, who placed at my disposal a quantity of the dried bark, an opportunity was afforded me of investigating its bitter principle. As the results obtained differ widely from these obtained by Mr. Broughton I am induced to place them on record.

The following was the mode of treatment. The bark, after being reduced to a moderately fine powder, was mixed with one fourth of its weight of lime and made into a thick paste with water. The mixture was dried and exhausted by percolation with boiling alcohol of 90 per cent. The percolate was acidified with sulphuric acid and the alcohol recovered by distillation. The residue was treated with hot water, filtered and the filtrate precipitated with caustic soda, when a gelatinous precipitate fell. The precipitate was collected, washed and dried in a water oven. Its weight was taken and found to be equivalent to 1·75 per cent. In this condition it presented the appearance of a blackish-brown gum-resinous mass, friable at the temperature of the water-bath, but readily becoming sticky through absorption of moisture as the temperature was lowered. It had a persistently bitter taste which was more quickly perceived when in solution than when in the solid state. It had an unmistakably alkaline reaction and dissolved readily in the mineral acids to all but neutralization. Its solution in dilute hydrochloric acid reacted with the following reagents:—With phosphomolybdic acid it gave a canary yellow precipitate; with iodide of bismuth and potassium, a brick red; with iodine in iodide of potassium, a brown flocculent precipitate; with iodide of mercury and potassium, a cream-coloured precipitate; with iodide of cadmium and potassium, a feebly coloured precipitate; with picric acid, a bright yellow precipitate, and with tannic acid a brownish precipitate. The several precipitates were amorphous. If to these reactions be added the fact that the body contained a quantity of nitrogen there can be no reasonable ground to doubt its alkaloidal character. In order, however, to study its properties more fully and with greater certainty it was necessary to resort to some method of purifying it. It was found that treatment of its alcoholic solution with animal charcoal was far too wasteful. The object was largely accomplished by digesting the crude alkaloid in a limited quantity of ether, dissolving the ether residue in acetic acid, and submitting the solution to partial precipitation with caustic soda or ammonia. The result was a white gelatinous precipitate, which became yellow on drying and assumed a darker colour when subjected to a temperature of 100° C. It dissolved readily in ether, alcohol and chloroform, but was little soluble in water. Its solution in alcohol of 95 per cent. had no action on a beam of polarized light. With the mineral and many organic acids it formed amorphous salts. Every attempt to crystallize the alkaloid or its salts of the mineral acids proved a complete failure. It began to fuse at about 120° C. Its solution in hydrochloric acid gave precipitates with perchloride of mercury, ferro- and ferridcyanide of potassium, iodide of potassium, phosphate of sodium, chloride of sodium and ammonium and nitrate of sodium. The precipitates resembled each other in character, and varied in colour from grey to brownish-yellow. The sulphate of the alkaloid was precipitated by nitric acid. Knowing as a matter of experiment that both beberine and quinoidine behaved in a similar manner towards these reagents, the thought was naturally suggested that the body I had isolated might be identical with one of these alkaloids, or more probably with paricine.

To decide this point a platinum compound of the alkaloid was prepared, and the percentage of carbon and hydrogen contained in the alkaloid itself was estimated. The double compound, when freshly formed, was a yellow amorphous precipitate, which became reddish yellow on drying at 110° C. On ignition it left 20·08 per cent. of platinum. The formula $(C_{16}H_{18}N_2O.HCl)_2+PtCl_4$—the platinum compound of paricine as determined by Hesse—requires 19·68 per cent., while that of beberine requires 19·50 per cent., and quinoidin from 26·28 to 26·59 per cent. of platinum respectively.

The combustion of the alkaloid was made with cupric oxide in a current of oxygen. Before it was burnt it was dried at 115° C. The mean of a series of satisfactorily accordant results gave 75·82 per cent. of carbon and 9·8 per cent. of hydrogen as against 75·59 per cent. of carbon and 7·08 per cent. of hydrogen for paricine dried at 100° C. Here it will be observed that while the carbon is within the limit of experimental error the hydrogen lies quite outside the field of computation.

A not improbable explanation of this anomaly—if anomaly it be—is to be found mainly in the high temperature at which the alkaloid was dried. This

* Read at an Evening Meeting of the Pharmaceutical Society, April 4, 1883.

was adopted as being the one at which beberine becomes anhydrous. Subsequent experiments proved that the alkaloid suffered partial decomposition, becoming converted into a resinous substance. Be this as it may, this much may be affirmed, that the bitter principle of the *dried* bark of *Hymenodictyon excelsum* is not the glucoside æsculin or its decomposition product æsculetin, but an alkaloidal substance. That as such it is allied to quinoidine, beberine and paricine. From quinoidine it differs in being optically inactive and from its double compound containing relatively less platinum. From beberine it differs in that it contains a higher percentage of carbon, while its double compound also yields a relatively larger amount of platinum. From paricine it differs alone in the percentage of hydrogen it gave, to which reference has already been made. So far the balance of evidence is clearly in favour of paricine.

In that I have been compelled, through force of circumstances, to discontinue for a time my investigations upon this subject, constitutes my apology for presenting the results while yet in so incomplete a condition. So soon as opportunity affords, I hope to resume my work on this inquiry and satisfactorily determine the identity of the alkaloid.

It may be stated that 2·5 per cent. of a waxy substance was extracted from the bark.

[*The discussion on this paper is printed at p.* 832.]

REMARKS ON SOME MEDICINAL PLANTS OF CEYLON.*

BY W. C. ONDAATJE, F.L.S.,
Colonial Surgeon of Ceylon.

It is well known that several Indian drugs have been incorporated into the British Pharmacopœia, which have added to the number of remedial agents, thus conferring no small advantage on the medical profession, and the publication of the Pharmacopœia of India has conferred an incalculable benefit on the medical practitioner in the East, but still there are many medicinal plants of the colonies and India which deserve a scientific examination.

The public revenue of the colonies is applied to many useful purposes for promoting the general welfare of the people. I believe that if a sum of money were voted annually to be expended in carrying out the chemical examination of indigenous drugs and other products by competent persons in this country, all expenditure would be well repaid by the advantages reaped in the saving of Government expenses for medicines and in the demand created for native products.

It is a matter of great importance to the millions in the East, and in fact to the whole community, that they be enabled to avail themselves of efficient substitutes for many official drugs which our colonies supply.

I may here mention that the annual cost of drugs for the use of the public service of Ceylon forms a considerable item. The natives are now more largely availing themselves of European medical practice, since the extension of Government hospitals and dispensaries, and consequently an increasing expenditure under this head cannot be avoided without detriment to the best interests of the population.

The necessity for adopting such a measure as I have suggested will be apparent to those who have studied Indian drugs.

The natives of the East have attributed imaginary properties to many plants and drugs, and much that is absurd is mixed up with much that is valuable.

While clinical observations in hospitals and medical colleges are of much importance to ascertain the therapeutic action, chemical examination will perfect the knowledge thus obtained, and will, with the aid of pharmacy, show the best mode of preparation and administration, and no institution can more efficiently carry out this work than the Pharmaceutical Society of Great Britain.

I will now proceed to make a few brief remarks on some medicinal plants which I brought with me from Ceylon.

1. *Randia dumetorum*, Lam.—The seeds of this tree are used by the natives of Ceylon and India as a reliable agent in producing emesis.

I am not aware that any chemical examination has been made to detect the active principle.

It belongs to the same family (Cinchonaceæ) as *Cephaelis Ipecacuanha*, and it would be important to determine if it contains emetine, more particularly since an allied species, *R. uliginosa*, is, according to Dr. Dymock, used in India as a remedy for dysentery. This species is also indigenous in Ceylon. The bark of *R. dumetorum* also possesses the same qualities.

I have seen the powdered seeds used with as good effect as ipecacuanha in doses of 5 to 10 grains. If analysis should prove *Randia* to possess the same active principle as ipecacuanha, a great saving might be effected by its substitution for the more expensive Brazilian drug.

Some weeks ago I had the pleasure of presenting a small quantity of the fruit to your Museum.

2. *Sethia acuminata*, Arn.—This is a remedy much used by the Cinghalese as a vermifuge. The part used is the leaves, the juice of the leaves being mixed with sugar and castor oil, or with the powder of the leaves. The leaves are easily powdered when dried.

Professor Bentley notices its vermifuge properties in his 'Manual of Botany.'

Dr. Thwaites, in his 'Enumeratio Plantarum Zeylaniæ,' also refers to it. He says, "the Cinghalese attach much value to this plant as an anthelmintic for children, giving the juice expressed from the fresh leaves." It is chiefly used for expelling round worm and possesses the advantage of not having a disagreeable taste. The powder is used in the dose of 10 to 15 grains.

I presented a small quantity of the leaves and a flowering specimen of the plant to your Museum.

3. *Coscinium fenestratum*, Colebr.—Many years ago, while using it as a tonic, I found by experiment that it possessed *antiseptic* properties, to which I beg to invite your attention.

I found that pieces of beef immersed in an infusion of the stem were preserved for several weeks. I am unable to give more details, as my notes made in Ceylon are not at hand.

I also used in Ceylon a weak infusion of the stem as a lotion for foul ulcers with great success.

I believe the plant has already been subjected to chemical analysis in this country and contains the active principle berberia.

It has been used also as a yellow dye. As this drug has recently been imported in quantity into England it could easily be obtained, and an examination of the cause of its antiseptic properties seems desirable.

4. *Vateria Indica*, L.—Some of the bark of the tree I have presented to your Museum. The natives use it daily to arrest the alcoholic fermentation of

* Read at an Evening Meeting of the Pharmaceutical Society, April 4, 1883.

the juice of the Jaggery palm, *Caryota urens*, which is a favourite beverage with them. This property of preventing fermentation might, I think, be turned to account in some of the great manufacturing industries, if not in medicine, and I trust the bark may be thought deserving of chemical investigation by some members of your Society.

5. *Semecarpus Gardneri*, Thw.—The black resin yielded by this tree, although not possessing medicinal properties, may be of some interest in the arts.

I have presented to the Museum some of the resin.

The resin is hard, breaks with a smooth fracture, burns with a bright flame, is soluble in turpentine, and adheres strongly to wood and metal. It is free from acridity.

The formula for using the resin as a varnish is as follows:—

To a saturated solution of *Vateria Indica* resin in oil of turpentine, add by degrees pieces of black resin, and put it into a bottle and shake it well until the whole is dissolved, then apply it to wood or metal, which will give a varnish of great lustre and beauty. The resin should be first melted and strained through coarse calico or a sieve, to free it from impurities.

6. *Vernonia anthelmintica*, Willd.—This plant is cultivated by the Cinghalese and is in great repute as a remedy, which is indicated by its name.

The seeds are black, of a bitter and nauseous taste, are easily procured from bazaars, and are commonly used by the village people for expelling the ascaris lumbricoides and act as a vermicide.

The dose of the powdered seed to an adult is from ½ to 1 drachm.

The native physicians prescribe it generally as a tonic in the shape of an infusion.

The Cinghalese name is *sanne nayan* and the Tamil name *kadoseragam*.

European practitioners in India, from personal observations, confirm the truth of the above statement.

7. *Alstonia scholaris*, R. Br.—In 1865 I forwarded to England, to my friend and correspondent, Mr. P. L. Simmonds, the Editor of the *Technologist*, specimens of a kind of caoutchouc, as a substitute for gutta-percha.

The following information supplied by me appeared in that periodical for August 1865:—

"Another substitute for gutta-percha, the milky juice of the *Alstonia scholaris*, a tree belonging to the natural order Apocyneæ, has been forwarded from Ceylon by Mr. Ondaatje; it is stated to possess the same properties and to be workable as gutta-percha. It readily softens when plunged in boiling water, is soluble in turpentine and chloroform, receives and retains impressions permanently, and is adapted for seals to documents."

The bark of this tree is thick and spongy. Its properties as a medicinal agent are fully described in the Pharmacopœia of India.

8. *Acorus Calamus*, Linn.—The well-known sweet flag I merely notice as an anthelmintic, which property is not included in the Indian Pharmacopœia.

An infusion of the rhizome or root-stock given to young children acts effectually, as I have seen many such cases treated among the natives.

I hope on a future occasion to be able to contribute further notes on the native materia medica of Ceylon.

[*The discussion on this paper is printed at p.* 833.]

NOTE ON ESSENCE FROM GREEN GINGER.*

BY C. SYMES, PH.D.

The increased use of ginger by manufacturers of mineral waters and others, of late years, has created a demand for a "soluble essence," *i.e.*, an essence which, when mixed with water, causes little or no opacity therein.

Dr. Thresh's scientific investigation of the constituents of this rhizome, particularly of the nature of its resinous constituents, added considerably to our knowledge of its composition. But strange to say, the process devised by him on the basis of this investigation, for the preparation of a soluble essence did not give (to my mind) very satisfactory results. Indeed, Dr. Thresh has since testified to the superiority of an essence produced by another maker.

It would seem, therefore, that the field is still open for the application either of science, or the results of experience. The contribution I have to offer this evening is a simple, short, and practical one. Many, indeed most, drugs deterioriate by age, whilst some few, such as *Rhamnus Frangula* bark, are said to improve as they grow older, at least to a certain point. Now, it occurred to me, that the nature and properties of ginger, and its behaviour towards certain solvents of its active constituents, may not be constant at all periods, and the receipt from Rio Janeiro of a supply of green ginger grown at Santa Catherina, enabled me to make an experiment in this direction. The ginger, of which I have here a sample, occurs in large pieces; it is quite soft, and is not decorticated. Two methods were tried for removing the outer portion; the one simple scraping, the other by first soaking in boiling water. The latter did not appear to possess any special advantage, and by the former it lost fully 15 per cent. of its weight. After a few hours' exposure to the air it was weighed, thoroughly dried and reweighed, when it was found to have lost 65 per cent. of moisture.

Taking a sample of the ginger from which the epidermis had been removed, and which had been surface-dried by exposure for a few hours to the air, I cut it in thin slices, and macerated it for some days with an equal weight of rectified spirit, which, when filtered, yielded an essence possessing a very fine aroma, and which when mixed with water scarcely rendered it turbid in the least degree. It is fairly strong, and could doubtless be prepared stronger were the drying of the ginger carried a little further. Probably, however, its solubility would diminish if the drying were completed, and of course the result would cease to be essence of green ginger.

[*The discussion on this paper is printed at p.* 834.]

A NOTE ON SAP.*

BY PROFESSOR ATTFIELD, F.R.S.

Beneath a white birch tree growing in my garden I noticed, yesterday evening, a very wet place on the gravel path, the water of which was obviously being fed by the cut extremity of a branch of the birch about an inch in diameter and some ten feet from the ground. I afterwards found that exactly fifteen days ago circumstances rendered necessary the removal of the portion of the branch which hung over the path, 4 or 5 feet being still left on the tree. The water or sap was dropping fast

* Read at an Evening Meeting of the Pharmaceutical Society, April 4, 1883.

from the branch, at the rate of sixteen large drops per minute, each drop twice or thrice the size of a "minim," and neither catkins nor leaves had yet expanded. I decided that some interest would attach to a determination both of the rate of flow of the fluid and of its chemical composition, especially at such a stage of the tree's life.

A bottle was at once so suspended beneath the wound as to catch the whole of the exuding sap. It caught nearly 5 fluid ounces between eight and nine o'clock. During the succeeding eleven hours of the night 44 fluid ounces were collected, an average of 4 ounces per hour. From 8.15 to 9.15 this morning, very nearly 7 ounces were obtained. From 9.15 to 10.15, with bright sunshine, 8 ounces. From 10.15 until 8.15 this evening the hourly record kept by my son Harvey shows that the amount during that time has slowly diminished from 8 to a little below 7 ounces per hour. Apparently the flow is faster in sunshine than in shade, and by day than by night.

It would seem, therefore, that this slender tree, with a stem which at the ground is only 7 inches in diameter, having a height of 39 feet, and before it has any expanded leaves from whose united surfaces large amounts of water might evaporate, is able to draw from the ground about 4 litres, or seven-eighths of a gallon of fluid every twenty-four hours. That at all events was the amount flowing from this open tap in its water system. Even the topmost branches of the tree had not become, during the fifteen days, abnormally flaccid, so that, apparently, no drainage of fluid from the upper portion of the tree had been taking place. For a fortnight the tree apparently had been drawing, pumping, sucking—I know not what word to use—nearly a gallon of fluid daily from the soil in the neighbourhood of its roots. This soil had only an ordinary degree of dampness. It was not wet, still less was there any actually fluid water to be seen. Indeed, usually all the adjacent soil is of a dry kind, for we are on the plateau of a hill 265 feet above the sea and the level of the local water reservoir into which our wells dip is about 80 feet below the surface. My gardener tells me that the tree has been "bleeding" at about the same rate for fourteen of the fifteen days, the first day the branch becoming only somewhat damp. During the earlier part of that time we had frosts at night, and sunshine, but with extremely cold winds, during the days. At one time the exuding sap gave, I am told by two different observers, icicles a foot long. A much warmer, almost summer, temperature has prevailed during the past three days and no wind. This morning the temperature of the sap as it escaped was constant at 52° F. while that of the surrounding air was varying considerably.

The collected sap was a clear, bright water-like fluid. After a pint had stood aside for twelve hours there was the merest trace of a sediment at the bottom of the vessel. The microscope showed this to consist of parenchymatous cells, with here and there a group of the wheel-like or radiating cells which botanists, I think, term sphere-crystals. The sap was slightly heavier than water, in the proportion of 1005 to 1000. It had a faintly sweet taste and a very slight aromatic odour.

Chemical analysis showed that this sap consisted of 99 parts of pure water with 1 part of dissolved solid matter. Eleven-twelfths of the latter was sugar.

That the birch readily yields its sap when the wood is wounded is well known. Phillips, quoted by Sowerby, says:—

> "Even afflictive birch,
> Cursed by unlettered youth, distils
> A limpid current from her wounded bark,
> Profuse of nursing sap."

And that birch sap contains sugar is known, the peasants of many countries, especially Russia, being well acquainted with the art of making birch wine by fermenting its saccharine juice.

But I find no hourly or daily record of the amount of sugar-bearing sap which can be drawn from the birch, or from any tree, before it has acquired its great digesting or rather developing and transpiring apparatus—its leaf system. And I do not know of any extended chemical analysis of sap either of the birch or other tree.

Besides sugar, which is present in this sap to the extent of 616 grains—nearly an ounce and a half—per gallon, there are present a mere trace of mucilage; no starch; no tannin; $3\frac{1}{2}$ grains per gallon of ammoniacal salts yielding 10 per cent. of nitrogen; 3 grains of albumenoid matter yielding 10 per cent. of nitrogen; a distinct trace of nitrites; 7·4 grains of nitrates containing 17 per cent. of nitrogen; no chlorides, or the merest trace; no sulphates; no sodium salts; a little of potassium salts; much phosphate and organic salts of calcium; and some similar magnesian compounds. These calcareous and magnesian substances yield an ash when the sap is evaporated to dryness and the sugar and other organic matter burnt away, the amount of this residual matter being exactly 50 grains per gallon. The sap contained no peroxide of hydrogen. It was faintly if at all acid. It held in solution a ferment capable of converting starch into sugar. Exposed to the air it soon swarmed with bacteria, its sugar being changed to alcohol.

A teaspoonful or two of, say, apple juice, and a tablespoonful of sugar put into a gallon of such rather hard well-water as we have in our chalky district, would very fairly represent this specimen of the sap of the silver birch. Indeed in the phraseology of a water-analyst, I may say that the sap itself has 25 degrees of total, permanent, hardness.

How long the tree would continue to yield such a flow of sap I cannot say; probably until the store of sugar it manufactured last summer to feed its young buds this spring was exhausted. Even within twenty-four hours the sugar has slightly diminished in proportion in the fluid.

Whether or not this little note throws a single ray of light on the much debated question of the cause of the rise of sap in plants I must leave to botanists to decide. I cannot hope that it does, for Julius Sachs, than whom no one appears to have more carefully considered the subject, says, at page 677 of the recently published English translation of his text-book of botany, that "although the movements of water in plants have been copiously investigated and discussed for nearly two hundred years, it is nevertheless still impossible to give a satisfactory and deductive account of the mode of operation of these movements in detail." As a chemist and physicist myself, knowing something about capillary attraction, exosmose, endosmose, atmospheric pressure and gravitation generally, and the movements caused by chemical attraction, I am afraid I must concur in the opinion that we do not yet know the real ultimate cause or causes of the rise of sap in plants.

Ashlands, Watford, Herts.

[*The discussion on this paper is printed at p.* 834.]

CATALOGUE OF SPECIMENS OF CINCHONA BARK, WITH ILLUSTRATIVE BOTANICAL SPECIMENS,

FORWARDED THROUGH HER MAJESTY'S SECRETARY OF STATE FOR INDIA FOR THE PHARMACEUTICAL SOCIETY FOR GREAT BRITAIN.

Number on Specimens.	Name of Specimen.	Number of Herbarium Specimens.	Kind of Bark.	Habitat.	Remarks.
				NILGIRIS.	
1/2	*C. officinalis*, *Uritusinga*	1	Natural .	Dodabetta .	This is the *C. Uritusinga*, type of Pavon.
2/7	*do.* *do.*	1	Mossed .	do. .	*C. Uritusinga*, Pavon type.
3/12	*do.* *Condaminea*	1	Renewed	do. .	*C. Condaminea*, How. variety.
4/15	*do.* *do.*	1	do.	do. .	*do.* How. type.
5/22	*do.*	1	From coppice shoots	do. .	These botanical specimens and also the bark were taken from coppice shoots.
6/27	*do.*	1	Renewed after shaving.	do. .	The bark belonging to this specimen is renewed, after the tree had been subjected to the Java shaving process. In this the outer cellular portion is shaved or pared off, the inner vascular layer being left intact.
7/28	? corky bark	1	Natural.	do. .	Bark covered externally with a thick corky layer, and very peculiar, of officinalis type but undetermined species.
8/29	*C. officinalis*	1	Renewed	do. .	
9/36	*do.* *Condaminea*	1	do.	Naduvattam	This is the *C. Condaminea* type of How.
10/9	*do.* *Uritusinga*		do.	Dodabetta .	Large leafed or *C. Uritusinga*, Pavon type.
11/16	*do.* *angustifolia*	1	Mossed .	do. .	This is the No. 1 form of *C. Angustifolia*, How., according to the estate nomenclature.
	do. *do.*	0	Renewed	do. .	
12/13	*do.* *do.*	2	do.	do. .	This is the No. 2 variety, in the estate nomenclature, of the variety *C. angustifolia*, How.
A/0	*do.* *Uritusinga*	0	Natural .	do.	
B/44	*do.*	0	do.	Naduvattam	
C/25	*do.* *angustifolia*	0	do.	Dodabetta	
D/0	*do.* *Uritusinga*	0	Mossed .	do.	
E/43	*do.*	0	do.	Naduvattam	
F/42	*do.*	0	do.	do.	
G/0	*do.*	0	Renewed	Dodabetta	
13/0	*C. Pitayensis*	1	Natural .	do.	
14/0	*do.*	1	No bark.	do.	
15/1	*C. Pahudiana*	1	Natural .	do. .	This species was discovered by Hasskarl, cultivated on a large scale in Java and found to be worthless. From Java it was introduced into India, but fortunately its culture here never went beyond the stage of an experiment.
16/23	*do.*	1	Mossed .	do.	
17/50	*do.*	2	Natural .	Naduvattam	
18/5	? corky bark	2	Renewed	Dodabetta .	This plant was said by Cross, on his recent visit to the Nilgiris, to be the *C. crispa* of which he sent seeds from the Loxa Mountains. That it came from Loxa there is no doubt, as the few specimens of it on the estate of Dodabetta are growing amongst the "crown" barks introduced from that region. It differs, however, very much from the *C. crispa* of Tafalla, which belongs to the *C. officinalis* group of Weddell. In general appearance it is more nearly allied to Weddell's section *Pahudianæ*. Its bark is also very peculiar, in fact unique.
19/14	? do.	1	Natural .	do.	
20/32	*C. micrantha*	2	do. .	Naduvattam	
21/48	*C. Calisaya*	1	do. .	do. .	This form of the *C. Calisaya* grows to a considerable size and has bright green shining leaves, some of which measure from 6 to 7 inches in length by 3½ to 4 inches in width. Flowers pink, very sweetly scented.
22/49	*do.*	2	do. .	do. .	This plant approaches the *Boliviana* form of Weddell, but the *Calisayas* are most variable.
23/47	*do.* *Josephiana* .	1	do. .	do.	

Number on Specimens.	Name of Specimen.	Number of Herbarium Specimens.	Kind of Bark.	Habitat.	Remarks.
				NILGIRIS.	
24/38	*C. anglica*	1	Natural .	Naduvattam	This plant, according to Howard, is a hybrid between *C. Calisaya* and *C. succirubra*. On the other hand it is said to come perfectly true from seed, and in October last a planter sent me a fresh specimen of it from Wynaad, which had been raised from seed procured from Java, and which was identical with the Naduvattam plants. It appears to me to be only a variety of *C. Calisaya*.
25/35	*do.*	2	Renewed	do.	
H/46	*do.*	0	Mossed .	do.	
26/30	*C.* (*pubescens*)	2	Renewed Natural .	Dodabetta . do. .	This is not the *C. pubescens* of Vahl, but a plant which was considered to be a hybrid by the superintendent of the cinchona estates, the late Mr. McIvor. Mr. Cross, the explorer who was employed in collecting cinchona plants and seeds in the cinchona regions of South America for the Indian Government, regards it as the pubescent form of "Cuchicara," referred to by Dr. Spruce in the Parliamentary Blue Book of 1863, p. 116. Mr. McIvor stated that it is a hybrid between *Cinchona succirubra* and *Cinchona officinalis*.
27/10	*C.* (*pubescens*)	2	Renewed	do.	
28/37	*do.*	2	Natural .	Naduvattam	
29/39	*do.*	1	Renewed	do.	
30/6	?	1	Renewed	Dodabetta .	This plant has been known on the Government estates as "McIvor's hybrid" and "Magnifolia," and Mr. Cross, the South American explorer, pronounced it to be the *Pata de gallinazo*, referred to by Dr. Spruce at p. 117 of the Cinchona 'Blue Book,' of 1863, as the smooth variety of the "Cuchicara." The term "Magnifolia" applied to this plant is purely a local one, as it is in no way related to the *C. magnifolia* of Ruiz and Pavon. The Kew authorities, under date the 24th January, 1882, remarked, "it may be said with some certainty that the Nilgiri "Magnifolia" is not the *Pata de gallinazo* of Chimborazo." Mr. Howard, from bark alone, identified it as *C. coccinea*, Pav., which Spruce considered identical with *C. erythrantha*, Pav. For a list of other species to which the name *Pata de gallinazo* has been applied, see Weddell's Notes, Article No. 10.
	do.	0	Natural .	do. .	
31/11	? *Pata de gallinazo* .	1	Renewed	do. .	Pata de gallinazo of Cross.
32/20	? *do.* .	1	Mossed .	do. .	Do. do.
33/34	? *do.* .	1	Natural .	Naduvattam	Do. do.
34/40	? *do.* .	2	Mossed .	do. .	Do. do.
35/31	*C. succirubra*	1	Renewed	do.	
	do.	0	Mossed .	do.	
36/33	*do.*	2	Natural .	do.	
K/0	*do.*	0	do. .	do.	
L/0	*do.*	0	Mossed .	do.	
M/0	*do.*	0	do. .	do.	
N/0	*do.*	0	Renewed	do.	

C. officinalis. Specimens for microscopical sections, showing point of junction between renewed and natural bark.

GOVERNMENT C. MUSEUM,
Madras, 27th January, 1883.

BIDIE, M.B.C.I.E., *Surgeon-Major*,
Superintendent, Government C. Museum, Madras.

The Pharmaceutical Journal.

SATURDAY, APRIL 7, 1883.

Communications for the Editorial department of the Journal, books for review, etc. should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary, 17, Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE POSITION OF PHARMACISTS IN RELATION TO THE PHARMACOPŒIA.

THE unanimity with which the Council, at its meeting on Wednesday last, agreed to the motion of Mr. HAMPSON on the subject of the Pharmacopœia, proves that British pharmacists think the time has come when they should occupy a legally recognized position in respect to the compilation of the text-book which has towards them the force of law. The occasion is certainly opportune. A quarter of a century has now elapsed since the Council established under the Medical Act of 1858 was authorized to publish under its direction one National Pharmacopœia, which should authoritatively take the place of the three Pharmacopœias then existing in the British Islands. At that time, though there was already a promise of better things, it cannot be said that the status of pharmacists in this country was such as to entitle them as a body to expect legal recognition as coadjutors with the medical profession, even in a work for one department of which the pharmacist is so peculiarly well fitted as the preparation of a Pharmacopœia. The task of producing the national medicine book therefore fell inevitably to the medical profession alone, as represented in the Medical Council, by whom it was accomplished with a success that has called forth grateful recognition, not only from members of the medical profession, but also from pharmacists, and might well explain and excuse a certain amount of sentimental objection felt in some quarters,—though, we believe, not widely,—to any proposition which might have the appearance of disturbing a kind of vested interest which the Council had during this time acquired to a monopoly in the ordering of the Pharmacopœia. The twenty-five years during which the Medical Council, as at present constituted, has been in existence have, however, brought many changes, and, thanks to the work done by the Pharmaceutical Society, pharmacists in this country are now in a position to undertake duties which could not have been accorded to them when first the unification of the three Pharmacopœias was decided upon. Consequently, signs have not been wanting of a growing disposition to put forward claims with respect to the position of pharmacists towards the next edition of the British Pharmacopœia which the Medical Council might have found it impossible to acknowledge and embarrassing to refuse. That the claims themselves are not, however, thought to be unreasonable may be assumed from the fact that the organ of the British Medical Association has, within the last few weeks,* reiterated an opinion expressed some years ago on the occasion of the publication of the "Additions," as to the "necessity of giving greater prominence to the element of practical pharmacy in the Pharmacopœia Committee."

In this condition of affairs the introduction into the House of Lords by the Government of a Bill having for its object to substitute for the body which has so long had the control of the Pharmacopœia another one very differently constituted, furnishes a *tabula rasa* for the reconsideration of the whole subject, without the slightest suspicion of discourtesy or rivalry to anyone. But since in this Bill it is simply proposed to vest in the new body exclusively powers similar to those exercised by the old, it will be learnt with satisfaction that the Pharmaceutical Council has instructed one of its Committees to take immediate steps to secure the introduction into the Bill of a provision by which pharmacists shall be empowered, conjointly with members of the Medical Council, to revise and prepare future editions of the British Pharmacopœia.

It will be for the Committee to decide upon the arguments with which it will approach the Government upon the subject. But a strong one would appear to be available in the resolution which less than two years since was adopted by the International Pharmaceutical Congress assembled in London, to the effect that the future revision of any national Pharmacopœia should be entrusted to a permanent committee comprising among its members the largest possible number of pharmacists. Moreover, the important discussion, following the reading of a paper by the present President of the Pharmaceutical Society, which led up to the adoption of this resolution, showed that the proposition was no innovation, but that already in every country represented at that Congress pharmacists held a legally recognized position together with medical men in respect to the duty of revising the national Pharmacopœia.

As, notwithstanding the justice of the claim which the Council has determined to urge at the present juncture, some little extraneous effort may possibly be necessary in order to overcome the inertia inherent to conditions that exist, it may serve a good purpose to recall a few of the statements made at the Congress upon the subject. Looking first across the Channel towards our nearest neighbour, M. PETIT said that the French Codex Commission should, according to law, be composed solely of professors of medical schools and professors of superior schools of pharmacy; but to these have been added members of the Société de Pharmacie with only a consultative voice. In practice, however, the greater part of the work is done by the Société de Pharmacie and the other pharmacists belonging to the

* *British Medical Journal*, March 10, p. 478.

Commission, the medical members rarely attending the meetings and the decisions being generally arrived at by the pharmacists alone. Respecting Germany, Dr. CARL SCHACHT was able to say that the Pharmacopœia Commission, then engaged upon the work just issued, included seven practical pharmacists. In this Commission the decision as to the admission of new medicines, or the expunging of obsolete ones, lay with the medical members, but the pharmacists alone had the decision as to the manner in which the preparations were to be made. A small sub-committee, consisting of chemists and pharmacists only, was entrusted with the working out of the chemistry and pharmacy of each subject, and the results were afterwards submitted for the approval of the Commission at a general meeting. In Austria, according to Herr VON WALDHEIM, the Pharmacopœia Commission consists of the Superior Board of Health and six chemists, who are summoned from time to time when any alteration or addition is thought to be required. In Russia, Dr. POEHL says the revision of the Pharmacopœia is carried out by the Medical Council, which includes two pharmacists among its members, the Pharmacopœia being first drafted by these pharmaceutical members acting by themselves, and then submitted to a full meeting of the Council for confirmation. In Italy, according to Signor SINIMBERGHI, the Commission entrusted with the preparation of the first national Pharmacopœia for the new Kingdom, as originally appointed, consisted entirely of medical men, but representations having been made to the Government, an equal number of pharmacists were added to the Commission. Dr. DE VRIJ described a position just the reverse of this as obtaining in Holland, where in 1864 the King appointed a Commission consisting of two professors of botany and pharmacology and one of chemistry, and four pharmacists, so that at first pharmacy was preponderant, whilst medicine was absent; at the request of the pharmacists, therefore, a medical member of the Commission was appointed. In Denmark the existing Pharmacopœia was prepared by a Commission consisting of eight physicians and two pharmacists. In Belgium, according to Professor GILLE, the Commission engaged at the time of the Congress upon the revision of the Pharmacopœia was composed of three pharmacists and two medical men. Lastly, the recently issued edition of the United States Pharmacopœia is, as has been before stated, the work of a large Revision Committee, including a majority of pharmacists.

It will be seen, therefore, that whilst these Commissions present many points of difference they have all one feature in common, in the provision made that whilst medical men are present to decide as to the selection of new or the rejection of obsolete remedies the practical skill of pharmacists is utilized in working out the best methods of preparation.

THE VISIT OF THE BRITISH ASSOCIATION TO CANADA.

FROM a circular just issued by the Executive of the British Association it would appear that it has been decided to waive the opposition which the unexpected decision of the General Committee to accept an invitation to visit Montreal, if repeated for 1884, at first provoked, and as far as possible to secure that the meeting shall be a representative one, "creditable to the Association and gratifying to the Canadian hosts." Certainly the prospective hosts are doing all they can to remove every obstacle by means of arrangements that will ensure every visitor from this country an opportunity of making the most of his time at a minimum of expense. The inhabitants of Montreal have now repeated the invitation, as stipulated, and have already formed committees on invitation, finance, and conveyance, and opened a guarantee fund. The Dominion Government has also undertaken to ask Parliament to contribute a sum of twenty thousand dollars in aid of the money subscribed by the public.

The circular includes a letter from Sir A. T. GALT, High Commissioner for Canada, resident in this country, containing information as to the probable expenses that will be involved in attending the meeting, every line of which bears evidence of the generous hospitality the colonists are prepared to accord. In the first place, in respect to the cost of the journey to and from Montreal, the Committee offer to arrange fifty free passages for the conveyance of the officers of the Association whose attendance at the meeting is indispensable. Beyond this it is prepared to devote the balance of £3000 either to securing to a number of *bonâ fide* members passages at the single rate—about £15 10*s.*—for the single journey, or for a general reduction of the fares as far as the funds will admit. Arrived at Montreal, the Committee are willing to give assurance that free entertainment will be provided for at least one hundred and fifty, and probably for all others who may attend. But even those who may scruple to accept such free hospitality are told that the tariff of Montreal hotels ranges between two and a half and four dollars a day inclusive, whilst private accommodation may be obtained at much lower prices than in England. As to proposed excursions, Dr. STERRY HUNT says that the Grand Trunk, the Canada Pacific and the Intercolonial railways will furnish free transport over their lines from Nova Scotia to the North West. The Canada Pacific will also arrange an excursion to the Rocky Mountains and the Grand Trunk one to the Great Lakes (including Niagara) and Chicago, while the South Eastern Railway will do the same for the White Mountains and Portland and Boston. For an excursion of this kind, occupying three or four weeks, it is estimated that a sum of £20 would be required for hotels, carriages and other incidental

expenses, though it is possible that a less sum will suffice.

The programme is a tempting one, and will give the members of the British Association an opportunity of visiting the Dominion under conditions more favourable than are likely to occur oftener than once in a lifetime.

THE ANNUAL DINNER.

We are pleased to be able to state that a large number of gentlemen, including the majority of the members of Council and all the officers of the Society, have already signified to the Honorary Secretary their desire to act as Stewards on the occasion of the Annual Dinner. But it is believed that there are many more, especially among the Local Secretaries, who will be glad of a further opportunity for sending in their names, and for this reason it has been thought advisable to postpone the closing of the List of Stewards until Wednesday next, the 11th inst.

The last Evening Meeting for the present session of the North British Branch of the Pharmaceutical Society will be held in the Society's Rooms, Edinburgh, on Wednesday evening next, when a paper on "The Preparation and Composition of Unguentum Hydrargyri Nitratis" will be read by Mr. T. Maben; after which Mr. Patrick Geddes will deliver a lecture on "The History and Present State of the Cell Theory."

* * *

The Government Medical Act Amendment Bill was read a second time in the House of Lords on Thursday evening, and committed to a Committee of the whole House, which is fixed for Thursday, the 19th inst.

* * *

An anonymous correspondent, using the suggestive initials A.B.C., asks in the *British Medical Journal* for an opinion on the following prescription which he appears to have written: "℞ Liq. ammon. acetatis ℥j; vini. ipecac. ℥js (? ℥ss); liq. morphiæ hydrochlor. ℥js (? ℥ss); syrupi acaciæ ℥j; aquæ, ad ℥j." He wished a two-ounce mixture to have been made, but his first doubt as to whether he had succeeded in expressing his intention correctly seems to have been excited when the prescription was shown to him at his patient's house, with the word "ad" marked through. A.B.C. is not particularly happy in explaining how his instructions were to have been carried out in their integrity, and as if conscious of his non-success, he adds: "If I am wrong, I pray Heaven that the examiners who allowed me to obtain my diplomas will try to find out if men know how to write a prescription accurately before giving a degree, and save them from the reproof of druggists." Probably most "druggists" will be ready to utter a devout "amen!" to this aspiration.

* * *

A correspondent, after describing in the current number of the *Medical Press and Circular* the "disreputable practice" of a qualified medical practitioner in keeping a chemist and druggist's shop, managed by an unqualified assistant, who also prescribes and signs certificates in the name of his principal, asks whether a M.R.C.P. Edin. is allowed to keep a druggist's shop, and sell penny nostrums and patent medicines. The reply is of course in the affirmative; but whilst deploring the fact the Editor informs his correspondent that "unfortunately such examples are legion in poor neighbourhoods." Both question and answer are worth pondering by those medical practitioners who are fond of blaming chemists and druggists for the propensity displayed by the public to seek medical relief in the chemist's shop.

* * *

One of the tendencies of medical dispensing is illustrated in the *British Medical Journal* of last week by a request of a correspondent for information as to the making of concentrated infusions "similar to those sent out by wholesale druggists."

* * *

The *Lancet* recommends prescribers who are in the habit of ordering pills to be coated to make the experiment of dissolving one of such pills in a bag of slightly acidulated liquid at a temperature of nearly 100° F., and prophesies that in a majority of cases it will be found, even when frequent agitation is applied, that the "mass is barely approached by the fluid after many hours and does not completely break down until a very considerable period has elapsed." The inference drawn is that "pills coated with gold, silver and even mastic—unless quite recent—are not brought into a condition in which the drugs of which they are composed could be appropriated by the stomach until long after the time of administration."

* * *

The new edition of the United States Pharmacopœia would appear to be meeting with a large sale, since a fresh issue—the third or fourth—has been announced as just ready.

* * *

After a lapse of more than six years a new edition—the fifth—of the 'Price List' compiled by the Committee appointed at a general meeting of Chemists and Druggists of Glasgow and neighbourhood has been issued. It contains a few modifications in the dispensing charges, chiefly in the direction of inserting alternative lower prices, and in the retail list, to which also a number of articles have been added. Copies may be obtained from the Convener of the Committee, Mr. J. A. Clarke, 148, Gallowgate, Glasgow.

* * *

At the next Wednesday evening meeting of the Society of Arts, on the 11th inst., a paper will be read on "The Portrush Railway and the Transmission of Electricity," by Mr. A. Siemens and Dr. Hopkinson.

* * *

In the Chemical Section of the same Society, on Thursday evening, the 12th inst., Mr. R. W. Atkinson will read a paper on "The Formation of Diastase from Grain by Moulds."

* * *

At the meeting of the Chemists' Assistants' Association, on Wednesday evening next, a paper will be read, entitled "A Few Hints on Germ Disease," by Mr. W. R. Dodd.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL.

Wednesday, April 4, 1883.

MR. MICHAEL CARTEIGHE, PRESIDENT.

MR. SAMUEL RALPH ATKINS, VICE-PRESIDENT.

Present—Messrs. Andrews, Borland, Bottle, Butt, Churchill, Gostling, Greenish, Hampson, Hills, Radley, Richardson, Robbins, Savage, Schacht, Squire, Symes, Williams and Young.

The minutes of the previous meeting were read and confirmed.

Nominations for Council and Auditors.

Council.

The Secretary reported that he had received *seventeen* nominations to fill the *fourteen* vacant seats on the Council, and that the following *sixteen* had declared their willingness to accept office if elected:—

Andrews, Frederick, 34, Leinster Terrace, W.
Atkins, Samuel Ralph, Market Place, Salisbury.
Baldock, John Henry, 3, High Street, South Norwood, S.E.
Borland, John, 7, King Street, Kilmarnock.
Bottle, Alexander, 37, Townwall Street, Dover.
Butt, Edward Northway, 13, Curzon Street, Mayfair, W.
Carteighe, Michael, 180, New Bond Street, W.
Hampson, Robert, 205, St. John Street Road, E.C.
Hills, Walter, 225, Oxford Street, W.
Radley, Wm. Valentine, 42, Hampton Road, Southport.
Richardson, John G. F., Elmfield, Stoneygate, Leicester.
Robbins, John, 147, Oxford Street, W.
Savage, William Dawson, 4, Park Road East, Brighton.
Symes, Charles, 14, Hardman Street, Liverpool.
Woolley, George Stephen, 69, Market Street, Manchester.
Young, John Rymer, 42, Sankey Street, Warrington.

The following had declined to accept office:—

Sandford, George Webb, 47, Piccadilly.

Auditors.

Hodgkinson, William, 198, Upper Whitecross Street, E.C.
Lescher, Frank Harwood, 60, Bartholomew Close, E.C.
Stacey, Samuel Lloyd, 300, High Holborn, W.C.
Thompson, Henry Ayscough, 22, Worship Street, E.C.
Watts, William Manning, 32, Lower Whitecross St., E.C.

Elections.

MEMBERS.

Pharmaceutical Chemists.

The following, having passed the Major examination and tendered their subscriptions for the current year, were elected "Members" of the Society:—

Ball, Henry .....Southport.
Drew, Walter Clark .....London.
Marshall, Joseph Jewison .....Beverley.
Rouw, Theodore John.....Eastbourne.

ASSOCIATES IN BUSINESS.

The following, having passed their respective examinations, being in business on their own account, and having tendered their subscriptions for the current year, were elected "Associates in Business" of the Society:—

Minor.

Austen, Charles Wilson .....Chatham.
Bolton, Frederic William .....Winchester.
Evans, Thomas Fryer .....Flint.
Francis, Charles Ernest .....Burnley.
Gray, John ..... Forres.
Guy, Frederick.....Brighton.
Hodgson, Alfred .....London.
Horrod, Thomas Samuel.....London.
Knight, Ramsey .....Pendleton.
Lindewald, Wilhelm Edvard ..Menton, France.
Newsam, William Henry .....Stoke-Ferry.
Stirling, George .....Dunoon.
Watson, John .....Newcastle-on-Tyne.
Willis, Henry James .....New Brompton.

Modified.

Bolton, Edgar Benjamin.....Winchester.
Hern, William Henry, jun. ...London.

ASSOCIATES.

The following, having passed the Minor examination and tendered (or paid as Apprentices or Students) their subscriptions for the current year, were elected "Associates" of the Society:—

Dadson, Horace Charles .....King's Lynn.
Davies, Llewelyn .....Newport, Mon.
Hudson, William .....Sunderland.
Ombler, William Henry .....Windsor.
Puckey, Courtenay .....Herne Hill.
Reeves, Alfred .....London.
Smith, Harry James .....Speenhamland.
Wall, Edward John.....Peckham.
Walton, Frederick Miles.....Reading.

APPRENTICES OR STUDENTS.

The following, having passed the Preliminary examination and tendered their subscriptions for the current year, were elected "Apprentices or Students" of the Society:—

Adams, Joseph .....Bristol.
Bayley, Cornelius.....Boston.
Bulmer, John .....Pocklington.
Elliott, Henry Alfred .....Derby.
Field, Ebenezer.....Cambridge.
Heath, Walter Edwin .....Coleshill.
Henshall, Harry .....Lymm.
Jones, William .....Bolton.
McDiarmid, Fraser .....Deal.
Moody, William Morton.....Salisbury.
Terry, Edwin .....Tadcaster.
Walklett, George James .....Oxford.
Watkins, William Richards ...Llanelly.
Weston, Henry.....Devizes.
Wride, William Blake.....Shirley.

Several persons were restored to their former status in the Society upon payment of the current year's subscription and a fine.

Restorations to the Register.

The names of the following persons who have severally made the required declarations and paid a fine of one guinea, were restored to the Register of Chemists and Druggists:—

James Benjamin Bond, 6, Cornbrook Street, Manchester.

Edward Todd, 110, Newhampton Road, Wolverhampton.

Addition to the Register.

The Registrar reported that—

Alexander Clark, 89, Gilmore Place, Edinburgh, having made a statutory declaration that he was in business before the passing of the Pharmacy Act, 1868, and this declaration having been duly supported by qualified persons, his name had been placed on the Register.

Honorary Members.

The President reminded the Council that it was usual to elect Honorary Members in May, but looking to the fact that the number was limited to fifty, and that there are already forty-eight on the list, and also that a proposal had been made to create a class of Corresponding Members, he suggested that no election should be made at present.

This suggestion was unanimously agreed to.

Reports of Committees.

FINANCE.

The report of this Committee included a recommendation that various accounts be paid; also that a certain sum be guaranteed towards the expense of laying down wood pavement in Great Russell Street, outside the Society's premises (some portion of which would probably be subscribed by other householders), in consideration of which it was stated that the District Board of Works was prepared to undertake this improvement.

The report stated that some correspondence with regard to the purchase of ground rents had been laid before the Committee.

The Committee also recommended that a sum not exceeding £10 be expended in repairs, etc., of the Society's premises in Edinburgh.

After some conversation, the report and recommendations were received and adopted.

BENEVOLENT FUND.

The report of this Committee included a recommendation of the following grants:—

£10 to a pharmaceutical member for twenty-nine years.

£5 to a registered chemist and druggist, aged 71, who had a grant of £10 in March, 1882.

£10 to the widow of a life member, who died in March last.

£5 to a registered chemist and druggist.

£10 towards the support of Isherwood's orphans.

Two applications the Committee had declined to entertain, and one had been deferred.

Further information with regard to the case of the widow of a life member having been given by a member of the Council, the grant of £10 recommended by the Committee was increased to £15. With this alteration the report and recommendations were received and adopted.

Further particulars were also given by the Vice-President with regard to a case which he had been requested to investigate, the applicant being the wife of a member for many years, who is now in an imbecile condition. In this case a grant of £20 was made.

LIBRARY, MUSEUM, LABORATORY, AND HOUSE.

Librarian's Report.

The report of the Librarian had been received, and included the following particulars:—

Attendance.		Total.	Highest.	Lowest.	Average.
February	Day	608	40	19	25
	Evening	197	18	4	10

Circulation of books.	No. of Entries. Town.	Country.	Total.
February	180	134	314

Carriage paid, £2 4*s.* 3½*d.*

The undermentioned Donations to the Library had been received, and the Committee recommended that the usual letter of thanks be sent to the respective donors:—

Britten (J.), Dispenser's Vade-mecum, 3rd ed., 1863. From Professor Attfield.

Mathematical Questions, with Solutions, edited by W. J. C. Miller, vol. 38, 1883. From the Editor.

Putsage (J.), Le determinisme et la science rationnelle, 1883. From the Author.

The Committee recommended that the undermentioned works be purchased:—

Allen (G.), The Colours of flowers, 1882.

Brewer (The), Distiller and Wine Manufacturer, 1883.

Deutsche botanische Gesellschaft, Berichte.

Hardwich (T. F.), Manual of Photographic Chemistry, 9th ed., 1883.

M'Alpine (D.), Botanical Atlas. 2 vols.

Schützenberger (P.), On Fermentation, 1880.

Curator's Report.

The Curator had reported the attendance in the Museum during February to have been:—

	Total.	Highest.	Lowest.	Average.
Morning	523	32	11	20
Evening	134	12	0	6

The following Donations to the Museum had been received, and the Committee recommended that the usual letter of thanks be sent to the respective donors:—

Specimen of Natal Cayenne Pepper Pods.
From Messrs. Hodgkinson, Stead and Treacher.

Specimen of Chilian Aniseed.
From Messrs. Horner and Co.

Specimens of Chilian Aniseed.
From Messrs. Jenkin and Phillips.

Specimens of Paraldehyde, Aldehyde Ammonia and Aldehyde resin, and of the root of *Dorstenia Brasiliensis*.
From Messrs. Hopkin and Williams.

A letter had been received from the India Office, stating that a very complete collection of cinchona specimens had been forwarded from the Madras Government and on arrival would be sent to the Society.

The Professors had attended and reported satisfactorily as to their respective classes.

The Council went into committee to discuss in detail some of the matters mentioned in the report.

On resuming, the report was received and adopted.

GENERAL PURPOSES.

The report of this Committee was taken as usual in committee. It included the reports from Professors Bentley and Redwood as to the class examinations at the end of the first course (five months).

Professor Bentley had reported that the attendance and conduct of his students had been very satisfactory, the number being larger than last year.

Professor Redwood's report had also been of a highly satisfactory nature, stating that the attendance had been regular and punctual, and that there had been evidence at the after-lecture examinations of the existence, among a large number, of a desire to avail themselves of the means provided for their instruction. There had been fifteen competitors, eleven of whom furnished papers in which answers were given to the whole twelve questions. He did not recollect ever having had such a large number of equally good papers at a one course examination.

The Committee, having opened the motto envelopes to ascertain the names of the successful competitors, recommended that the following awards be made:—

Chemistry and Pharmacy.

Bronze Medal	David Rees.
Certificate of Merit	Edward Baily.
,, ,,	Charles Ranken.
,, ,,	Sidney Phillips.
,, ,,	Francis Ransom.
,, ,,	Thomas Southall Dymond.
,, ,,	William Edward Crow.
,, ,,	James Haddock.
,, ,,	David Low.
,, ,,	Edward Ernest Sewell.
,, ,,	Arthur Pumphrey.

Botany and Materia Medica.

Bronze Medal	William Edward Crow.
Certificate of Merit	Edward Baily.
,, ,,	David Low.
,, ,,	William Lloyd Williams.
,, ,,	Sidney Phillips.

The report also included the usual letter from the Solicitor stating the result of certain actions which he had been instructed to commence, and the progress which had been made in others. It reported that—

Edward Clayton Lewin, 7, Whimple Street, Plymouth, had paid £10 penalties and costs £8 7*s.* 10*d.*, as reported in last week's Journal, for the sale of poisons and use of title "Chemist."

Thomas Harrison, 42, Marsh Lane, Leeds, had paid £5 penalty for sale of poisons.

W. E. Pratt, Beck Street, Nottingham, had paid £5 penalty for use of the title "Chemist and Druggist."

Alexander G. Clark, 89, Gilmore Place, Edinburgh, had paid £5 penalty for carrying on the business of a chemist and druggist.

It also contained particulars of various other matters which had been brought before the Committee.

A long discussion took place in committee on some of the matters referred to in the report. On resuming, the report and recommendations were received and adopted unanimously.

The Amended Pharmacy Bill.

Mr. Churchill asked if there was any report from the Parliamentary Committee with regard to the various suggestions which had been sent up by local societies and meetings with respect to this Bill.

The President said the Committee had not yet considered these suggestions; it could not very usefully do so until it knew what were the intentions of the Government.

Mr. Symes thought some reply was desirable to the various bodies throughout the country which had been sending up recommendations, and were anxiously looking forward to know what would be the result. These people had never had any opportunity of discussing the Bill or any of its clauses before it was sent to the Privy Council, and, therefore, it was only reasonable that such communications should now be received. He had no doubt the Council would consider these suggestions and send a reply to them, because such a course would best tend to ensure unanimity when the Bill came before Parliament. If on the other hand the Council went to Parliament with all these men feeling that their views had not been duly considered, they would be very likely to oppose the Bill at a very important time.

The President said he could assure Mr. Symes and the Council that every one of these suggestions would be most carefully considered, but it would be much more convenient to deal with the whole of them together: one was coming forward that day, and there might be amendments coming from the Government. The Committee could not deal with the matter efficiently until the whole of these proposed amendments were before it.

Mr. Symes said he thought this statement would be quite satisfactory.

The Council again went into committee whilst the President answered several questions which were put by members with reference to the Bill, and the action which was being taken in respect to it.

Visitors to the Museum.

Mr. Symes said he wished to ask a question regarding the Museum. At page 232 of the Calendar there was a note saying that persons not eligible to become members of the Society who were desirous of obtaining admission to the Museum must make application to the Secretary, and he wished to know whether that rule would prevent the Secretary from granting admission to a person who was eligible to become a member. The case in point was that of a person who had passed the Preliminary examination, but not with a view of becoming a chemist and druggist; but prior to an examination he wished to pass, he asked, in his father's name, that he might be permitted to use the Museum for a few days in conjunction with his brother, who was studying at the School of Pharmacy. The two came together; the one who subscribed to the Society was, of course, admitted, but the other was refused. He came next day at his father's request, and again asked admission, but did not see the Secretary and was requested to withdraw. His father, who was a member, then came and made a similar application and was informed by the Secretary that the rules prevented his granting it. He (Mr. Symes) did not blame the Secretary in any way, for he had no doubt he had acted according to what he considered his duty, but it would be well for it to be understood by members generally whether they had any influence in introducing visitors to the Museum for proper purposes, or whether the Secretary had discretionary power in the matter. If no good reason were alleged for not joining the Society, but it appeared to be only an excuse for saving a half-guinea subscription, then no doubt it was quite proper for admission to be refused. It was not so much in the interest of any individual he asked the question as of the members generally.

The President said it was almost impossible for him to say what the Secretary might think it his duty to do. He took it they would all be disposed to give him the utmost latitude in dealing with such cases, and he could conceive that a few cases might occur in the course of the year where some discretion must be placed in the hands of their officer, and if he had not already exercised it it would be convenient for him to do so.

Mr. Symes said he did not understand that the note he had referred to dealt specially with the case of persons who were eligible to join the Society, although it might be inferred that they were meant to be excluded.

The President said the obvious intention was that the Museum should not be used to the detriment of those connected with the Society. The house was not large enough to accommodate all students, but he fancied the Secretary might manage to use a discretion by which the Museum might be placed at the service of anyone who was not likely to abuse the privilege.

The Vice-President said the gentleman referred to had written to him in his official capacity calling his attention to the matter. He had not the slightest charge to bring against the Secretary, who had, no doubt, acted fully within the law and according to the best of his light; but he thought the Council might do him a service in giving him a little more latitude, or intimating its wish that in cases where he was convinced there was no *mala fides*, he should be allowed to grant admission. The strong point seemed to be this, that the young man was not seeking to save his half-guinea by deferring his subscription until a later period, the fact being that he was going into veterinary practice. His father, who was an old member, thought he had a privilege, which it seemed he had not. It was a pity that an old member should be alienated if the law could be relaxed a little.

Mr. Richardson said this was not the first time a similar complaint had been made, for he remembered a case of the kind some two years ago. He thought, therefore, it would be well if it were referred to a committee to consider whether more power should not be given to the Secretary. Cases might occur where gentlemen from the country would be put to great inconvenience through being refused admission.

Mr. Hampson thought the Library Committee might very well consider the matter. He was sure the Secretary did not wish to exclude anyone who was really eligible, but possibly he might have been too zealous in serving the Society. The simple fact seemed to be that the present regulations were a little too rigid, and probably the Committee on consideration might be able to introduce a little more elasticity.

Mr. Greenish thought the Secretary ought to be asked to give his account of the matter. This question had been discussed several times within his recollection by the Library Committee, and the Secretary had been allowed a certain amount of discretion, which had been used on the whole very satisfactorily. If any discretion were used at all, admission must sometimes be refused, for if every one were admitted there would be no advantage to subscribers.

The President did not understand that there was any complaint made against the Secretary, it was simply a question whether the regulations in the Calendar were not a little more tightly drawn than was convenient.

The Secretary said the matter was very simple; it was a mere question of pounds, shillings and pence. If

the Council said the Museum should be open to anybody who felt disposed to use it there was an end of the subject. He did not desire discretionary power, which would be unsatisfactory to all parties. Looking at the results for the last year it appeared that there were 1037 apprentices and students who subscribed to the Society, being about one-third of those who were on the Register as having passed the Preliminary examination. Were the other 2000 to be allowed the same privileges as these men who contributed to the funds? The gentleman who now complained had passed his Preliminary examination, and it was competent to him, if disposed, to acquire the right to use the Society's house as part of his own property; but he did not think that he should have been doing right in discharging his duties if he had allowed him to use the Museum the same as those who subscribed. His father came and said he was a member of the Society, and that he felt in that position he was able to delegate his privileges of using the Museum to whom he felt disposed, either his son or anybody else. In reply he had been informed that he had a right to use the Museum himself, but the privilege could not be delegated to anyone.

Mr. SYMES said there was no imputation on his part on the Secretary, who he had no doubt felt he was acting strictly according to the rules.

After a little further conversation, it was decided to leave the matter to be considered by the Library, Museum, Laboratory and House Committee.

MEDICAL ACTS AMENDMENT BILL.

Mr. HAMPSON then moved a resolution of which he had given notice, though in a somewhat different form, as follows:—

> "That inasmuch as the Medical Acts Amendment Bill introduced into the House of Lords contains no provision by which pharmacists shall be empowered, conjointly with members of the Medical Council, to revise and prepare future editions of the British Pharmacopœia, the Library and Museum Committee be authorized to take immediate steps with a view to remedy this omission."

He said he considered that this motion was a very important one, inasmuch as up to the present time British pharmacists had not been recognized in the making of the Pharmacopœia to which they were compelled to comform. When the Pharmacopœia received the sanction of the Privy Council, it became, to all intents and purposes, a legal document, and pharmacists were bound to obey it, and it appeared to him that it was very strange after the Society had been engaged for many years in granting degrees to practise pharmacy according to the Act of Parliament, and in furthering education in every possible way, that pharmacists were simply to remain as heretofore servants in the matter, having no official voice in the preparation of the Pharmacopœia. In all other civilized countries where Pharmacopœias were used, scientific pharmacists took a part in their preparation on equal terms with the medical men, but in England, up to the present time, they had been entirely left out and ignored. The Government had now brought in a Bill to amend the Medical Act, the Bill being the result of a commission of inquiry held last year, and the Pharmacopœia was referred to in the Bill. Seeing the word mentioned he naturally looked to see if the Pharmaceutical Society or British pharmacists received any official recognition, but to his astonishment, he found that if this Bill became law the old conditions would prevail. He supposed the probable reason of this was that pharmacy was very slow in development in this country. On the continent of Europe, pharmacy, as a distinct branch of medical art, had received the sanction of the state for many years, and it was not to be expected that they in England should at once receive the reward which the education and improved culture of pharmacists in this country entitled them to do. It seemed to him that the Council was now bound in self-respect to make this request, for unless it did so pharmacists would probably have to wait twenty years until they could do so with any effect. Years ago, before the Society had got fairly into work, it might have been inequitable to make such a request, but it was felt now that it was entitled to fair recognition when legislation was in progress, and he could not conceive that the medical profession would object to the proposal. Anything which would advance pharmacy by giving it an improved social and scientific status must be beneficial to the medical profession. In making this request it would be clearly understood that the Society did not claim anything except to be officially consulted as to the preparation, and methods employed: they had nothing at all to say as to what should be included or excluded. Physicians must appoint the dishes and say what should be served, but educated pharmacists had some claim to speak with reference to the preparation of the dishes. It was an old joke that pharmacists were only a sort of physicians' cooks, and that was perfectly true; but cooks generally prepared cookery books. They had been singularly fortunate in having Professor Redwood on the Pharmacopœia Committee as representing pharmacy up to the present time, and that gentleman was worthy of full recognition, but what he wanted to see now was a recognition of pharmacists as a body by giving to them an official share, by legal arrangement, in the preparation of the Pharmacopœia.

Mr. SYMES, in seconding the motion, said it must commend itself to the mind of any thinking person that the preparation of a Pharmacopœia consisted essentially of two portions: first, of the medicines which it should contain; and secondly, how they should be compounded and prepared. It was quite certain that members of the medical profession were fully competent for the first of those duties; but the tendency of their education during late years had been to render them less capable of dealing with the second branch of the subject than they formerly were, and there were no persons educated for that purpose, except the pharmacists. They must all feel that this was only a matter of justice; it could not be sought under the Pharmacy Act or in any other way than under the Medical Act, and he took it that the present Bill was in so forward a state, the second reading being put down for the next day in the House of Lords, that there was no time to be lost. He hoped, therefore, there would be a unanimous vote in support of the motion.

Mr. SCHACHT said this motion, as far as it went, had his cordial support, but as the greater included the less he should have preferred if it had embodied the suggestion which he put forward some time ago, that the Council should take steps to endeavour to get itself represented on the Medical Council. Mr. Radley had already asked that this new Medical Bill should be placed in the hands of all the members of the Council for consideration, and his proposition was that it should be considered in all its aspects with regard to pharmacy. If it struck any of his colleagues that a special attempt might be made to remedy the defect with regard to pharmacy, and that it was not too much to ask for such recognition as he had named, he should be glad, and it seemed to him this would be an opportune moment to assert that pharmacy was an essential ingredient in the art of medicine, and might fairly claim to be represented in some sort on the Medical Council. He did not think that at all too ambitious a position to take up, and it would be a good opportunity now to put it forward. Why pharmacy should be systematically ignored passed his comprehension, except upon the supposition that it was generally understood that what was not worth asking for was not worth having. Even if such a request were not granted at present it might be entertained in such a way that its acceptance at some future time would be more hopeful.

Mr. WILLIAMS suggested that Mr. Hampson should

explain what practical steps he thought ought to be taken.

Mr. HAMPSON said the motion itself referred to a committee which would necessarily take immediate steps to obtain the ear of the Government upon this question. That committee would have to consider what fair proposal it would have to make, and to formulate it before seeking an interview with the promoters of the Bill. He was not ready with any special proposal, but probably the experience of other countries would lead in a particular direction. He thought that was all he need say at present, the committee being left to consider details.

Mr. GREENISH cordially supported the motion. He only regretted that it had not been sent round in its amended form to members of the Council, because there were one or two expressions in the original notice of motion to which some exception might be taken. The remark had been made about pharmacists being physicians' cooks, which he wished to protest against, for at the present time a great many compounds came before the medical profession which never had any recipe for their formation in the proper cookery book, and it would be very desirable, in his opinion, if medical men would confine themselves to their recognized cookery book. He could quite understand that at the present time the medical profession was getting more than ever unable to frame a proper Pharmacopœia. Pharmacists did not wish to interfere with the remedial agents to be made use of, but simply to have a voice in laying down the methods by which those agents should be prepared. Medical education was advancing day by day, and as it did so medical men ceased to have much knowledge of pharmacy. When he was in St. Petersburg eight years ago, and an International Pharmacopœia was discussed, he had to state that in England pharmacists had no voice in their national Pharmacopœia, when the look of astonishment on the part of the different delegates at that Conference was perfectly unique. He believed this was the only civilized nation in which pharmacists did not sit upon the Committee for the formation of the Pharmacopœia. This was certainly the proper time to move in the matter, for the probability was there would be a Medical Council very differently constituted to what it had been. The Bill in question indicated the constitution of that Council, but there was no hint that any pharmacist should have a seat on the Pharmacopœia Committee.

Mr. YOUNG thought the Society would be justly blamed if it did not take this opportunity of making itself heard. It would be a very strange thing if after what the Pharmaceutical Society had done during the last twenty years no members of it were consulted in the formation of a new Pharmacopœia. He saw no objection whatever to the motion as it now stood, and hoped it would be carried.

The VICE-PRESIDENT also wished to support the motion. Reference had been made to the position that Professor Redwood occupied in the preparation of the last Pharmacopœia, and that seemed to him to be a very important point. It was at least a recognition of pharmacy, though in what way it originated he was not aware; but the fact of a well-known pharmacist being consulted by that Committee at any rate gave pharmacists a status, and was a small leverage which might be made use of again. With regard to Mr. Schacht's larger suggestion, of course, if pharmacists had a position on the Medical Council that would include the whole thing, but he thought their truer policy now would be to ask for recognition on this particular point. He believed that practical pharmacists found out soon after the last Pharmacopœia was published that there were many defects which would have been remedied had a practical man been on the Board, and if that consideration was brought forward, as well as the higher culture now possessed by the pharmaceutical body, he had no doubt the claim would be considered.

Mr. GREENISH said as a matter of fact the Pharmacopœia of 1864 was published without the assistance of any pharmacist at all, but as soon as it was published it was found to contain so many errors that it was immediately withdrawn, and Professor Redwood was called in to assist, but he had no vote.

Mr. ROBBINS said he believed pharmacists had always been called in in an indirect way, Mr. Phillips's assistance having been obtained with regard to the Pharmacopœia published in 1836.

The motion was then put and carried unanimously.

WRITTEN EXAMINATIONS IN THE PROVINCES.

The PRESIDENT then moved the following, of which he had given notice:—

"That on and after December 31, 1883, the resolution of January 7, 1874 (*Pharmaceutical Journal*, January 10, 1874, p. 563), respecting the method of conducting the Preliminary examination be rescinded, and that the following regulations be enacted, and come into force on January 1, 1884:—

"That persons be especially appointed by the Council to superintend the Preliminary examination in London and the provinces; that they be called Superintendents of examinations, and be paid fees for each examination; such Superintendents not being necessarily members of the Board of Examiners.

"That a Deputy Superintendent be also appointed by the Council in each centre.

"That a fee of one guinea for the first part and half-a-guinea for the second part of the examination be paid to the Superintendent or Deputy Superintendent on the occasion of each examination.

"That the Local Secretary be, in the first instance, offered the appointment of Superintendent.

"That the examinations be held in the months of January, April, July and October, on the second Tuesday of the month, from 11 a.m. to 4.30 p.m., with an interval of one hour from 2 to 3 p.m.

"That the examinations shall not be held in the house of the Superintendent or Deputy Superintendent, but he shall be authorized to engage some apartment suitable for the purpose, and charge a sum not exceeding 15*s.* to the Society on account thereof.

"That the examination for the Jacob Bell Memorial Scholarships be held annually on the second Tuesday in July, concurrently with the Preliminary examination.

"That notice be issued in the *Pharmaceutical Journal* two months prior to the day of holding the Preliminary examination, that such examination will take place, and giving a list of the centres at which it will be held.

"Candidates for the Preliminary examination must give notice to the Registrar not less than fourteen days prior to the day on which the examination is to be held, of their intention to present themselves for examination, and state the centre at which they desire to be examined.

"That the instructions to Superintendents and Deputy Superintendents of examinations be as follows:—

"INSTRUCTIONS TO SUPERINTENDENTS AND DEPUTY SUPERINTENDENTS OF EXAMINATIONS.

"*To be read aloud to the Candidates before commencing their writing.*

"*The Preliminary Examination.*

"The examination papers must be forwarded by the Registrar, under seal, to the Superintendents or Deputy Superintendents, so as to be received by them on the morning of the day fixed for the examination. Special sheets for the candidates to write upon will also be sent by the Registrar.

"Writing materials for each candidate must be provided, and all arrangements for the accommodation of the candidates completed before the hour fixed

for opening the packets of questions from the Registrar.

"Candidates must be in their places at the time appointed, and after this time no candidate will be admitted.

"Candidates must be placed at a sufficient distance from each other to prevent copying, and they are not permitted to take either books, scribbling papers, or memoranda into the examination room.

"The examination papers must be opened by the Superintendent or Deputy Superintendent at the appointed time, in the presence of the candidates, and immediately distributed by him.

"He must see that each candidate signs his papers in the place indicated.

"The answers to the questions are to be written on one side of the paper only, the other side being intended for scribbling and calculations; no other scribbling paper is allowed to be used.

"No examination paper shall be taken from the room until the examination is complete.

"The Superintendent or Deputy Superintendent must carefully watch the whole examination, to see that the candidates do not use unfair means, either by assisting each other, or using books or notes. No person except the Superintendent or Deputy Superintendent is permitted to be present, and on no consideration shall candidates be allowed to speak to each other after the papers are distributed.

"A candidate wishing to ask any questions must hold up his hand; the Superintendent or Deputy Superintendent will come to him and satisfy any legitimate inquiry, but no explanation will be given on the subject matter of the questions.

"At the expiration of three hours from the time of the distribution of the questions on Latin and arithmetic, the written papers of the candidates, with all memoranda and scribblings thereon, shall be delivered to the Superintendent or Deputy Superintendent, who must immediately enclose all the papers in the envelope sent for that purpose by the Registrar, seal it with his seal, and forward it by first post thereafter to the Registrar enclosing the accompanying declaration duly filled in and signed.

"At the expiration of one hour and a half from the time of the distribution of the questions on English, the written papers of the candidates, with all memoranda and scribblings thereon, shall be delivered to the Superintendent or Deputy Superintendent, who must immediately enclose all the papers in the enveloped sent for that purpose by the Registrar, seal it with his seal, and forward it by the first post thereafter to the Registrar enclosing the accompanying declaration duly filled in and signed."

He said the object of this proposition was simply to alter and amend the regulations in order to meet the resolution arrived at by the Council in December last, that the Preliminary examination should be conducted at two different periods of the day, with an interval between. It was found very difficult to move any direct resolution which would carry out that change, and, therefore, it was considered desirable to rescind the original resolution and begin with a new one.

Mr. BORLAND pointed out that the first two clauses of the second section seemed to have no special reference to the candidate, but only to the Superintendent. He would also point out that in Scotland, in order to avoid casualties which might arise from examination papers not arriving on the morning appointed, it was provided in the case of the Science and Art Department examinations, that the papers should be deposited in the hands of some responsible person in the neighbourhood twenty-four or forty-eight hours previously. He thought a similar arrangement might be desirable in this case.

Mr. SAVAGE said in the University Local examinations it was laid down that the candidates should sit four feet apart.

The PRESIDENT said he should be inclined to leave the Superintendent some discretion on such matters. It was possible to be too elaborate in detail.

Mr. HILLS said there seemed to be some difference with regard to the fee for the Bell Scholarship examination when held concurrently with the Preliminary. He supposed that was intentional.

The PRESIDENT said that was so.

Mr. HILLS remarked that formerly the Superintendents of the Preliminary on the day of the Bell Scholarship examinations received two guineas. In view of the proposed alteration in the examinations, he thought that the Society could well afford to make the fee two guineas on each occasion, as it was very important to obtain the services of the very best men at each centre.

Mr. WILLIAMS thought this being a matter which included the voting of money, it ought to have come before the Council on the report of a committee.

Mr. RADLEY thought one guinea was quite sufficient. He remembered the examinations being conducted for years without any fee whatever, and he did not think there would be any complaint from their friends in the country if one guinea only were paid. He had heard complaints sometimes of the extravagance of the Council, and he thought it would scarcely be justified in giving a guinea and a half merely for superintending.

Mr. BORLAND asked if some words could not be introduced so as to allow of a member of the Council being present at one of these examinations, if it took place at a town where he resided.

The PRESIDENT said he would rather leave the draft as it was. He thought any member of the Council presenting himself would not be refused admission.

The VICE-PRESIDENT asked if Mr. Borland knew of any case in which the papers had not been delivered on the appointed day.

Mr. BORLAND said he believed that was the cause of the regulations being introduced to which he had referred.

The VICE-PRESIDENT asked if there would be any objection to the Superintendent receiving a sealed packet twenty-four hours beforehand.

The PRESIDENT thought there would.

The VICE-PRESIDENT said it would certainly be an awkward dilemma if a number of youths were assembled, having come some distance, and had to go home in consequence of the papers not being ready.

Mr. HAMPSON suggested as there were several points which the Council was not quite agreed upon it would be as well to refer the regulations to the Library Committee if the subject did not press for immediate decision.

Mr. WILLIAMS said it was not at all unusual for letters from the north to be delivered in London some hours late, and the probability was, therefore, that the same thing occurred with letters going to the north.

Mr. SYMES said although on a former occasion he had criticized the resolutions as passed by the Council, he quite accepted the decision, though that made him scrutinize these regulations more closely. He must say they seemed thoroughly in conformity with the resolution of the Council.

The PRESIDENT said there was no occasion to press the motion that day, and, therefore, in accordance with the suggestion which had been made, he would agree to refer it to the Library and Museum Committee for report.

THE HANBURY MEDAL.

Mr. GREENISH asked if the President's attention had been called to the fact that two years had passed since the Hanbury medal was presented at the International Congress, and that it should be awarded this year. He suggested that the meeting in October, when the sessional address was delivered, would be a suitable occasion on which to publish the award and present the medal.

The PRESIDENT said his attention had been called to

the matter, although he had not yet taken any formal steps with regard to it. He thought the suggestion as to the time when the award should be announced was a very good one.

The Amended Pharmacy Bill.

The Secretary read a resolution which had been forwarded by the Chemists' Assistants and Apprentices' Association of Edinburgh, approving of the Pharmacy Act Amendment Bill and suggesting in the event of its becoming law that the Council should make provision by which the present Major examination should be continued after the year 1886.

The communication was referred to the Law and Parliamentary Committee.

Conversazione.

The Secretary stated that he had received a letter from the Lords of the Committee of Council on Education, stating that the South Kensington Museum would be placed at the disposal of the Society for holding its Conversazione on the evening of the 23rd of May next.

EVENING MEETING.

Wednesday, April 4, 1883.

MR. MICHAEL CARTEIGHE, PRESIDENT, IN THE CHAIR.

The last Evening Meeting of the present session was held on Wednesday evening, the 4th inst. Mr. Carteighe, President, occupied the chair.

The minutes of the previous meeting having been confirmed, a paper was read on—

The Bitter Principle of Hymenodictyon Excelsum.

BY W. A. N. NAYLOR.

The paper is printed on p. 817, and gave rise to the following discussion:—

The President said he was sure it would be the desire of the meeting that Mr. Naylor might shortly find an opportunity of completing his investigations on this subject.

Professor Bentley said that this question was invested with interest now in consequence of the "cuprea" barks and other barks obtained from allied plants, which were formerly placed among the cinchonas, having yielded a certain amount of cinchona alkaloids. At the first blush a botanist would naturally expect that *Hymenodictyon excelsum* would have yielded some of the alkaloids of cinchona, since the genus *Hymenodictyon* was formerly included in the genus *Cinchona*, and this plant was the *Cinchona excelsa* of Roxburgh. One would naturally expect to find paricine or some allied alkaloid. The first plant in which paricine was discovered, as far back as 1845, was a rubiaceous plant, namely the *Buena hexandra*. The interest of paricine being found in *Hymenodictyon excelsum* was still further brought out by the fact that it had been found in red bark together with quinamine. Therefore the investigation of substances derived from plants which had been within a comparatively few years disassociated from the cinchonas became a matter of great interest, and he looked forward with interest to the confirmation or otherwise of Mr. Naylor's present results by his further investigations.

Mr. Holmes said that his name had been mentioned by the author in connection with this bark, but he should like to disclaim any thanks with regard to the matter. The bark had been sent to him by Dr. Dymock, of Bombay, a gentleman who had in a most disinterested manner contributed very largely to the museum on various oocasions. Dr. Dymock had kindly promised to complete the collection of Indian drugs for the museum.

Dr. Ondaatje, referring to the virtues of *Hymenodictyon excelsum* as a febrifuge, said that he was in India many years back, when Sir William O'Shaughnessy was compiling his first book on Indian drugs, the 'Bengal Dispensatory,' and this drug was then tried in the hospitals of the Medical College and found to be most valuable. In mild cases of fever it was almost equal to the cinchona bark. There was another species almost as efficacious as the *Hymenodictyon excelsum*. He believed that it was the *H. laxiflorum*.

Mr. Luff wished to ask Mr. Naylor whether heat was employed in drying the pasty mixture of the powdered bark. He would suggest that Mr. Naylor, on resuming his investigations, should extract the alkaloid under somewhat different conditions. According to his (Mr. Luff's) experience of alkaloid work, Mr. Naylor had employed almost the very conditions which were most likely to bring about a decomposition of the alkaloid, namely, in the first place, contact with a fixed alkali, lime; in the second place, percolation with boiling or hot alcohol; in the third place, contact with a strong inorganic acid—sulphuric acid—during the distillation; and in the next place precipitation with a fixed alkali, caustic soda. In his experience those conditions were likely to produce that destruction of the alkaloid which was generally spoken of in chemical phraseology as saponification. This change consisted of a decomposition of the alkaloid into another alkaloid of a lower molecular weight and an acid. Probably the reason why Mr. Naylor obtained a resinous mass, and failed to get a crystallizable alkaloid or crystallizable salts, was that he had brought about this kind of decomposition. All the different kinds of alkaloids which Dr. Wright and he had worked upon were decomposed by contact with even warm alcohol, by contact with any of the alkalies, and by contact with any of the mineral acids. He would suggest that Mr. Naylor should percolate the bark with alcohol acidified with tartaric acid, for an organic acid produced scarcely any saponification, and avoid precipitation with a strong alkali such as caustic soda or potash. Assuming that the alkaloid present with the bark was paricine, which seemed probable, Mr. Naylor's experiments would point to an actual decomposition or saponification of the alkaloid, for the general result of saponification was that, whilst the carbon percentage of the alkaloid remained the same, the hydrogen percentage was increased; and this Mr. Naylor's figures showed.

Mr. Gerrard differed somewhat from the statement which had just been made by Mr. Luff, especially with regard to the use of lime as the means of liberating alkaloids under certain conditions. He thought that the process employed by Mr. Naylor was admirably suited for the purpose where an alkaloidal body was in combination with an acid of the tannic acid series. Lime lent itself most readily to combinations with acids of that series, and also with many of the colouring matters. Let any one take a sample of cinchona bark, and mix it with potash, soda, or ammonia, and another portion and mix it with lime, and prepare a tincture from each mixture; the difference of colouring of the two mixtures would be astonishing. Of course an operator conducting an experiment with lime and a bark would take care that he did not carry his temperature too high. It was possible to exhaust cinchona bark with lime and alcohol at a normal temperature, provided that the bark and the lime were in a proper state of division. He did not say that lime was adapted all round under all circumstances; but under certain circumstances it was the best agent. Especially was it the best thing for beberine. He had lately had a bark sent to him from the west coast of Africa, and he had experimented upon it with various alkalies, but he found lime the best of all. He should like to ask Mr. Naylor whether he prepared the hydrobromide or the phosphate of the alkaloid. Those salts usually yielded themselves very readily to crystallization, and as a rule they were insoluble in cold alcohol, but they dissolved readily in hot alcohol, from which they were generally deposited upon cooling in a crystalline form. That was, in his opinion, one of the best methods of obtaining a pure crystalline salt of an alkaloid. He should like to know what quantity of bark Mr. Naylor operated upon, as the quantity made a considerable difference in the

investigation. It was not possible to carry out a thoroughly exhaustive investigation with a small quantity; from 7 to 14 pounds were needed for a full investigation.

Mr. LUFF remarked that Mr. Gerrard had not brought forward any experimental evidence that lime did not bring about the decomposition which he (Mr. Luff) had mentioned.

Mr. TANNER said he should like to ask whether Mr. Naylor had examined the liquid from which the precipitate was obtained, and whether he concluded that by the precipitation of the body which appeared to be allied to paricine he had separated all the alkaloidal constituents. If not, Mr. Naylor's results and those obtained by Mr. Broughton might be brought into accordance. It was known that when alkaloids were precipitated with caustic soda or potash, the residual liquor might contain another body, even æsculin, or the product æsculetin. With regard to the non-crystallizability of the alkaloid, he should like to ask what solvents Mr. Naylor employed, for it was known that in some cases the addition of a body having a less solvent action on the alkaloid than the one in which it was dissolved would determine crystallization.

Mr. NAYLOR, in reply, said in reference to the remarks of Mr. Luff, that he did not think that any process which could be devised would be suitable for the extraction of an alkaloid in every instance. Had he not been pretty certain from preliminary investigations that the alkaloid in question was very closely allied to beberine on the one hand, and to quinine on the other, and further, had he not found the colouring matter somewhat troublesome, he certainly should not have employed such a process as the lime process. That process was by no means original. Not only was it largely employed for the extraction of quinine from cinchona barks, but it was the process which Dr. Hesse had himself made use of for the extraction of paricine. He thoroughly agreed with what Mr. Gerrard had said as to the use of lime, and he only needed to emphasize his remarks on that point. Oxalic acid was perhaps about as serviceable an acid as could be employed for the extraction in this case. It extracted the alkaloid with probably the minimum amount of colouring matter, and it might be advisable to employ a weak solution of oxalic acid; but decomposition took place very largely in the heating of the body afterwards. In reply to Mr. Gerrard, he might state that he did not prepare the hydrobromide, but he did prepare the phosphate, though he did not succeed in getting it to crystallize. The quantity of bark that he worked upon was 300 grams. The bark was tested for æsculin, but that body was not found. The solvents employed were benzol, chloroform, ether, petroleum spirit, acetic ether, organic acids and mineral acids. As to temperature, he had employed various temperatures ranging from 60° to 120°; and with regard to time, the periods had varied from very short ones to periods of four or five days, with a temperature of 110° F. It was well known that paricine had not yet been obtained in the crystalline condition. He wished it to be distinctly understood that he did not state that the body which he had obtained was paricine; that point remained for further investigation.

A vote of thanks to Mr. Naylor was then passed.

A paper was then read, entitled—

REMARKS ON SOME MEDICINAL PLANTS OF CEYLON,

BY DR. W. C. ONDAATJE, F.L.S.

The paper is printed on p. 818, and gave rise to the following discussion:—

The PRESIDENT said that it was always a pleasure to have members of the medical profession present at the meetings of the Society, and it was particularly gratifying to have present a member of the medical profession who had come from a long distance and brought with him typical specimens of the materia medica of his island, and who further enlightened the Society by a graphic description of them. The meeting was very much obliged to the author, both in his capacity of a member of the medical profession and in that of a pharmacologist.

Mr. HOLMES said that it was perfectly true, as Dr. Ondaatje said, that the natives of a country were very apt to ascribe imaginary virtues to some of their plants; but when a medical man who had made experiments on the properties of those plants came forward and stated which were valuable and which were not, he conferred a great favour both on pharmacists and on the medical profession. One of the specimens to which Dr. Ondaatje had called attention, *Sethia acuminata*, was a plant which was interesting, partly because it belonged to the same family as the coca, and partly because as an anthelmintic it was almost free from taste. Several of the anthelmintics which were in common use were not only disagreeable in their effects but also disagreeable in flavour. Another anthelmintic which had been mentioned, *Vernonia anthelmintica*, belonged to the same order as the Persian insect powder. It had somewhat astonished him sometimes that Persian insect powder had not been tried as a remedy for worms. If it killed insects outside the body, it might have a similar effect upon internal parasites. If any gentleman was willing to undertake the investigation of one or more of these drugs, he felt sure that Dr. Ondaatje would be quite ready to send him specimens in the quantity which had been mentioned, namely, from 7 lb. to 14 lb.

Mr. GERRARD inquired if Dr. Ondaatje could tell them if the bark of *Randia dumetorum* was known as emetic bark in Ceylon.

Dr. ONDAATJE said that he believed that it was so called, but he was not quite sure. He believed that the natives used the seeds of it as an emetic.

Professor BENTLEY said that he could not allow the paper to pass without expressing his thanks to the author for coming forward and giving his experience. It was most important that medical practitioners, who were scattered all over the world, should, when they were placed in a particular district, take an opportunity of trying the virtues of the remedies of the country. There was no doubt a vast amount of useless material, and it was almost impossible to sift it in this country; but medical men like the author of the paper could try the effects of the drugs in the country in which they grew, and separate the chaff from the wheat. If native remedies were not tested by practitioners like the author of the paper there would not be any opportunity of getting new remedies brought to this country. In different parts of the world there might be many drugs which would yet be found to be of incalculable benefit. With regard to *Randia dumetorum* it was a substance which had been known and canvassed over and over again. O'Shaughnessy spoke of it many years ago as being a remedy which was not at all reliable; but at the time of the compilation of the Indian Pharmacopœia, Dr. Bidie brought it forward as a substance well worthy of more particular investigation. Dr. Bidie spoke of the ripe fruit as being the active part of the plant. He (Professor Bentley) should like to know if the author had ascertained whether the valuable part was the seed or the fruit. There was no doubt that a substance which had been so long used deserved investigation, and it was desirable to know whether it contained emetia in any quantity and whether it could be employed as a substitute for ipecacuanha. *Sethia acuminata* was a well-known vermifuge. Anything concerning *Coscinium fenestratum* must be interesting to members of the Society, for he believed that he was right in saying that one of the earliest papers, if not the very first paper, which the lamented Hanbury read in that room was upon calumba wood, the origin of which he traced to that plant. As to the antiseptic properties of *Coscinium fenestratum*, as the author would know, there was nothing remarkable in a pure tonic possessing qualities of that kind. Quassia and

almost all pure tonics had the same effect in preventing the decay of animal matter. As to *Vateria Indica*, the statement concerning its power to arrest fermentation was altogether new to him, and he should take care to notice it. The plant was interesting as the source of a resin which at the time the Indian Pharmacopœia was brought out was spoken of as a substitute for the official resin. Moreover, the bruised fruit of the same plant yielded, when boiled, a fatty substance which was called "piney tallow." This substance had been used externally in different parts of India as a remedy for chronic rheumatism. As to *Semecarpus Gardneri*, the fact of its yielding resin was what one would naturally expect from any anacardiaceous plant. He was glad to have confirmatory evidence as to *Vernonia anthelmintica*. It had been well known for a long time that the seeds were used as a vermifuge. He was particularly interested in *Alstonia scholaris*, because the medical properties of the bark were well known as the author had noticed. With regard to the juice being a substitute for gutta percha, he should like to know whether the author had got any further information on that subject since his communication to Mr. Simmonds. The plant belonged to the order Apocynaceæ, which yielded substances analogous to gutta percha. In view of the difficulty of obtaining gutta percha, and in prospect of the loss of that substance, anything which would act as a substitute would be of incalculable value. If he recollected rightly he was a member of the Council of the Society of Arts in 1865, and therefore this subject had rather impressed itself upon his memory, for even at that time the Society of Arts offered a premium for a substitute for gutta percha. Gutta percha was then very largely in use, and there was a fear that in consequence of the destruction of the trees the substance would be entirely lost. The next substance mentioned in the paper, namely, *Acorus calamus*, or the sweet flag, was one which he had heard his dear old master, Dr. Pereira, speak of over and over again. He always used to say that it was an aromatic stimulant, superior almost to any other. It was a substance which was somewhat put aside in this country, but it was not so in other countries, and although it was not actually in the Pharmacopœia of India, it was at the present time in the Pharmacopœias of the United States and of Germany. This would show that there were a good many other people of the same opinion as his far-sighted and much respected old teacher as to the value of this substance. Its anthelmintic properties were new to him, and they added still more interest to the subject of sweet flag.

Mr. MARTINDALE said that no doubt the antiseptic properties of *Coscinium fenestratum* were due very largely to berberine, as Professor Bentley would acknowledege. Berberine was used very much in America to make lotions in cases of gleet and other diseases. Its antiseptic properties had never been well worked out.

Mr. ANDREWS said that there was an allusion made in this paper to a black varnish which was used in the arts. It had long been a desideratum among musical instrument makers to find a varnish which should be equal in hardness to the varnish which was found on old Cremona violins. He believed that age had a great deal to do with the hardness of that varnish; but there was certainly a very great benefit to be derived by any one who could, either by means of this varnish or any other, find a material which would be very hard and imitate the varnish of the old violin makers. Speaking from some little experience of the matter, he believed that the resonance or tone of a violin was, to a great extent, due to the quality of the varnish.

Mr. BLAND said that the question of "fiddleology" and the matters connected with it was one which would require many hours for its discussion; but he could tell the last speaker that he had set out on an entirely wrong datum if he thought that the Cremona varnish was a very hard substance. If he obtained a varnish which would produce a very hard surface he would not have Cremona varnish. This subject, however, was not one which could be gone into at that meeting.

Dr. ONDAATJE said that he was exceedingly obliged to Professor Bentley for his most interesting remarks on the paper, and he was highly encouraged to contribute to that great Society what he knew as to the plants of his island. With regard to the juice from *Alstonia scholaris*, he regretted to say that he had no further information than that which he had supplied to Mr. Simmonds, in 1865. His attention was called to the substance whilst he was travelling, for his servant, having accidentally cut the top part of a tree, he saw a large quantity of milky juice exuding from the cut branch, some of which he collected. A sample was sent in response to the prize offered by the Society of Arts for a substitute for gutta percha. As to *Randia dumetorum*, in Ceylon the seeds were used in the state of powder, and were found to be very efficacious. The author of the 'Supplement to the Indian Pharmacopœia' stated that in India the pulp was used. The drug had been employed in the east from time immemorial, and the tree was mentioned in all the ancient Sanscrit works as possessing valuable properties. As an emetic it was equal to ipecacuanha. It was in fact the ipecacuanha of the natives. The latter when in powder very often deteriorated in quality through being kept.

The next paper read was a—

NOTE ON ESSENCE FROM GREEN GINGER.

BY CHARLES SYMES, PH.D.

The paper is printed on p. 819.

Mr. TANNER asked whether this particular form of ginger was yet an article of commerce. If it was, it seemed that it was likely that it would come into very great demand. The essence was one which would seem to meet the requirements of a great many consumers.

Professor BENTLEY said that a great deal of it came over a few years ago. There would be no difficulty in getting it if there was a demand for it. This form of ginger had been described by Pereira.

Dr. SYMES said that he did not think it was a thing of very large demand. He was informed that its commercial value was somewhat low, simply because there was not much demand for it.

A vote of thanks was then accorded to Dr. Symes.

The next paper read was a—

NOTE ON SAP.

BY PROFESSOR ATTFIELD.

The paper is printed on p. 819, and gave rise to the following discussion:—

Mr. EKIN said that with regard to the chemical aspect of this very interesting paper, he took it that that must more or less be new. As to the botanical aspect of the paper, it was a well known fact that various forest trees bled immensely if they had their limbs lopped off, especially large ones, before the leaves were expanded. He did not remember ever having seen the rate of flow determined; that was certainly very wonderful. He once had under his observation a row of sycamore trees of considerable growth. Limbs of nearly a foot in diameter were lopped off, and the amount of bleeding was very great. The sap in that case was sweeter than the birch sap, as might be expected in the case of one of the maples. He was not surprised at the largeness of the quantity of sap yielded by such a tree, for the wood was very soft. But he had found sap exuding from the centre of a beech tree, the heart wood of which was very hard. The other part of the tree was dry, and not a leaf had expanded. He looked at some of the books, and according to them it seemed that the beech had no business at all to allow its sap to exude in that way.

Professor BENTLEY said that he should not have expected that such a large amount of sugar would have

been found in the sap mentioned by Dr. Attfield, although perhaps the particular nature of the birch might account for it. He had himself seen gallons of fluid come in a few hours from a wounded tree before the leaves had expanded; and the fact that the leaves had not expanded was the explanation of the matter. At this season of the year, before the leaves were expanded, the reserve materials of the tree were largely stored up in the root, and from chemical changes actively going on the fluids in that part became very dense, and the consequence was that an excessive osmotic action took place. There was far more fluid absorbed from the earth than the plant could use, and what botanists called "root pressure" took place. This was a matter which had not been clearly explained until the last few years; it had nothing to do with the leaves. The pressure which took place forced the fluid up the stem. This was clearly the explanation of what was called bleeding. The process did not take place at any other time of the year, for as soon as the leaves were fully developed, the fluid which was absorbed by the roots was naturally carried up the plant, and became transpired and thus carried off. Probably the ascending sap had greater force in summer, but the tree did not bleed, for the leaves carried off the fluid. An analysis of the sap of a tree at this time of the year by a competent chemist like Professor Attfield was exceedingly valuable and useful.

Professor ATTFIELD said that if there had been time he should have liked to ask Professor Bentley what root pressure was.

A note by Dr. Paul on the results of the analysis of samples of the cinchona barks recently received from Jamaica for the Museum was laid before the meeting by Mr. Holmes. The note will be printed in a subsequent number.

The President said he was sure the members would vote their cordial thanks to Dr. Paul for this very complete series of analyses.

Mr. HOLMES then called attention to various specimens of Indian bark which had been forwarded under the instructions of the Indian Government by Surgeon-Major Bidie, the Superintendent of the Museum at Madras. A descriptive catalogue of the barks, and of the Herbarium specimens accompanying them, is printed on pp. 821, 822. Mr. Holmes said that the barks were accompanied by excellent specimens of the plants themselves, representing the flower, the leaf, and the fruit, the Herbarium specimens being labelled with numbers corresponding to the numbers of the barks. The specimens had been prepared with the greatest care, and full details had been given in each case, both of the plant and of the bark. This was one of the most valuable collections of Indian barks which had ever been sent to this country. Great credit was due to the gentleman who had superintended the collection of these specimens. It would be possible in the future for any person who wanted to identify the bark which he was using to do so by comparing it with the Museum specimens. Two of the specimens were very interesting from a botanical point of view as showing that the cinchonas, like the elms and maples of England, sometimes produced a bark which was excessively corky. The cork in some of these barks varied from $\frac{1}{4}$ inch to $\frac{1}{2}$ inch in thickness. There was also on the table a specimen of *Manilla Elemi* presented by Messrs. Evans, Lescher and Webb. It was imported in a new kind of packing, which he had never seen before. There was also a specimen of crude and refined ozokerit and an elastic bitumen from Castleton, in Derbyshire, somewhat approaching the coorongite of Australia.

The PRESIDENT said that the members of the Society would better appreciate the very complete catalogue of the specimens which had been sent with the collection of barks when they were able to read it. The Council of the Society had already expressed its thanks officially to the Government of India for its courtesy in passing on to the proper authorities the request of the Society to be furnished with these specimens. They had been collected and arranged under the personal superintendence of Surgeon-Major Bidie. If it had not been for Surgeon-Major Bidie's zeal, probably the Society would not have been so successful in getting a complete collection, and certainly not so successful in getting such excellent botanical specimens. Their thanks were eminently due to him and the officials of the Government for their courtesy.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

The anniversary meeting of this Society was held at Burlington House, on Friday, March 30th. Dr. J. H. Gilbert, F.R.S., President, in the chair.

The President read his annual report. There have been occasions in the history of the Society when important questions had to be discussed, sometimes involving matters of internal working and management, at others the consideration of some new departure with a view to more extended usefulness. At present there are no such questions requiring special notice; the attainment of the objects for which the Society was founded is steadily progressing, and the President, taking advantage of the fact that he was elected a Fellow during the first session of the Society, now nearly forty-two years ago, presents the Society with a review of its progress from the commencement of its existence up to the present time. Of the twenty-five gentlemen who met on February 23, 1841, for the formation of the Society, only two now remain in the list of the Fellows, and out of the one hundred and eighteen members on the register at the first anniversary meeting, March 30, 1842, only ten could now answer the roll call,—the President, Professor Andrews, Drs. De La Rue, Longstaff, Lyon Playfair, James Young, and Messrs. Heisch, F. R. Hughes, Pearsall and Denham Smith. The number of Fellows at the last anniversary was 1175. One hundred and four have joined during the past session. Nine have died,—Mr. John Gray, Mr. Dugald Campbell, Mr. J. J. B. J. Grosjean, Mr. A. Jesseman, Dr. G. A. C. Pearce, Dr. G. W. Septimus Piesse, Mr. E. Wilcock, Professor H. J. S. Smith and Mr. Frank Hatton; twenty-three have withdrawn, etc., so that the present number of Fellows on the register is 1247. One foreign member, F. Wöhler, is deceased, whilst nine have been elected, the total number of foreign members being now thirty-seven. The objects of the Society, as stated by the founders, were the reading, discussion and subsequent publication of original communications and the formation of a chemical library and museum. The number of papers read during the five years ending 1846 was 167, giving an annual average of about 33; in 1854–55 only 17 papers were read; during the past session 70 papers were communicated to the Society, and one discourse on the "Recent Development of the Theory of Dissociation" was given by Professor Dewar. As to the Journal, 1775 copies were printed during the past year. About 1851 an attempt was made to found a museum in connection with the Society, and some specimens were sent from the great Exhibition, but were eventually again dispersed. The President suggests that as a nucleus of a future museum the authors of papers on new compounds might be requested to present specimens to the Society. A much more favourable account can be given of the library. At the time the last catalogue was issued to the Fellows in 1873, the number of volumes was 3540; since that time 3260 volumes have been added, making a total of 6800. During the same period the number of pamphlets has increased from 540 to 840. The Council have decided that a new catalogue, arranged in order of

subjects, shall be prepared, printed and issued to the Fellows as soon as possible. The income of the Society has steadily increased from about £183 in 1846 to over £3000. The report then dwells upon the vast facilities for the study of chemistry which are now afforded in all parts of this country, so that while less than fifty years ago there was no systematic course of analytical training in the kingdom, now almost every public school has some arrangements for teaching practical chemistry. With this great development in the past and all that it promises in the future there is surely every reason to believe that the Society must increase both in the number of Fellows and in the number and value of the papers communicated to it. There have been two offshoots from the Society during the last few years, the Institute of Chemistry and the Society of Chemical Industry, but neither has prospered at the expense of the parent Society; the valuable papers which have been published by the Society of Chemical Industry have probably been originated altogether under the auspices of the new Society, and are, so far, a pure gain rather than a transference of energy. The President then concluded this portion of the report with a most interesting *résumé* of the arrangements for chemical education and chemical research on the American continent, founded upon the experience gained during his recent tour in that country and on information received from Sir A. Galt, High Commissioner for Canada, and from His Excellency, Mr. Lowell, the American Minister in London.

Dr. Schunk said that all must regret that Dr. Gilbert was not in a position to accept the office to which he had been nominated by the Council; the Fellows were much indebted to him for his constant attendance and courtesy. He had much pleasure in proposing a hearty vote of thanks to Dr. Gilbert, and that his report be adopted. This was seconded by Professor Ronalds and carried unanimously.

Dr. Gilbert said that he appreciated very highly the honour of having been President, and most sincerely regretted that in consequence of the pressure of his own avocation, and his distance from London, he had been compelled to relinquish the office at the end of the first year. His successor was a tried officer of the Society, and had by his researches contributed largely to the interest of the meetings and of the Journal. It seemed only fitting that a chemist who had devoted himself specially to organic chemistry should fill the chair, when that branch of the science was so constantly brought forward at the meetings of the Society.

The Treasurer then presented his report. The total income of the Society was about £3073, the expenditure about £2770, leaving a surplus of £303. This surplus was rather smaller than last year for several reasons; there had been an increase in the expenses connected with the Journal of £217, and with the library of £61. The income was also rather less than was anticipated, owing to the fact that a smaller proportion than usual of the new Fellows had compounded. Next year there would probably be no surplus, as it would be taken up by the expenses connected with the new catalogue, and the redecoration of the Society's rooms. The assets of the Society consisted of £7788 stock and a balance at the bank of £1194. As to the Research Fund, £220 had been given in grants during the year: the assets consist of £4500 stock and a balance at the bank of £166. The donations to the Fund had fallen off considerably.

Mr. Warington proposed a vote of thanks to the Treasurer, which was seconded by Mr. Makins, and carried unanimously.

Votes of thanks were also given to the Auditors, the Council and Officers, and the Editor, Sub-Editor and Abstractors.

Messrs. W. Thorp and Newlands were then nominated Scrutators, and the following Officers and Council were declared duly elected:—President, W. H. Perkin, Ph.D., F.R.S.; Vice-Presidents, F. A. Abel, Warren De La Rue, E. Frankland, J. H. Gilbert, J. H. Gladstone, A. W. Hofmann, W. Odling, Lyon Playfair, H. E. Roscoe, A. W. Williamson, A. Crum Brown, P. Griess, G. D. Liveing, J. E. Reynolds, E. Schunk, A. Voelcker; Secretaries, H. E. Armstrong, J. Millar Thomson; Foreign Secretary, Hugo Müller; Treasurer, W. J. Russell; Council, E. Atkinson, Capt. Abney, H. T. Brown, W. R. E. Hodgkinson, D. Howard, F. R. Japp, H. McLeod, G. N. Makins, R. Meldola, E. J. Mills, C. O'Sullivan, C. Schorlemmer.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Acetic Ether.

Sir,—It would be unnecessary for me to notice the courteous criticisms of Professor Redwood and Mr. Abraham on my paper on "Acetic Ether," were it not evident that my postscript has not yet made clear how it was that I assumed the Pharmacopœia to mean liquids by measure. It is quite true that, following the scientific usage, I would have read such a formula as meaning parts by weight; but so far from Squire's 'Companion' bearing this out, it supports the interpretation I put on it. To quote Professor Redwood's words will at once show this: "I have never seen it (parts) used otherwise than to represent parts by weight, unless accompanied by an explicit representation of its having a different meaning, as in the case of Squire's 'Companion to the Pharmacopœia,' where the explanation is given at the head of every page, clearly indicating what would be inferred in the absence of such explanation." From this I understand, unless I suffer from mental obliquity, that as Squire distinctly says, "solids by weight —liquids by measure" at the top of the page containing the B.P. formula for acetic ether, this is an "explicit representation of its having a different meaning" from parts by weight, and "clearly indicating what would be inferred (viz., parts by weight) in the absence of such explanation."

Of course Professor Redwood's statement that parts by weight were meant at once settled this, and I am glad to find that the B.P. proportions correspond so well with my own. At the same time perhaps my remarks may not have been out of place, seeing that they have elicited an official explanation on the point. I should like to ask if the solubility (1 in 12 parts of water), is also intended to be taken by weight.

Mr. Abraham will doubtless, ere this, have noticed his mistake in referring to my proposed proportions, but for the benefit of others I will just draw attention to the error in his numbers. He gives my proportions as—

	According to Abraham.	As given in my paper.
Alcohol ·838.	50	50
Dry acetate of soda . .	62	74
Sulphuric acid, B.P. . .	92	110

How he has fallen into this error it is of no importance to discuss. The fact remains that my proportions show an excess of sulphuric acid along with the theoretical amount of sodium acetate.

I can assure Mr. Abraham that I find no difficulty in obtaining a uniform composition by following the directions given, and that the sp. gr. is always about 902 to 901, and the product (even without distillation) contains at least 97 to 98 per cent. ethyl acetate. It would be interesting if Mr. Abraham would analyse his sample "about sp. gr. 891, of pretty constant composition," and determine the percentage of ethyl acetate.

26, *S. Canongate.* Wm. Inglis Clark.

Communications, Letters, etc., have been received from Messrs. Rice, Abraham, Atkinson, Kirkby, Traub, Galen, Omega.

FLETCHERS' Concentrated Liquors.

We beg to direct attention to the following important additions to our List of Liquors for the extemporaneous production of Syrups.

Liquor Cocci.

A highly concentrated and *neutral* solution of the colouring matter of Cochineal.

ONE volume added to seven volumes of *Syrupus, B.P.*, forms SYRUPUS COCCI.

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IN the manufacture of this preparation, only the finest Valencia Saffron is employed.

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THIS preparation is eight times the strength of *Vin. Ipecac. B.P.*

ONE volume added to seven volumes of *Syrupus, B.P.*, forms SYRUP OF IPECACUANHA.

Liquor Limonis.

PREPARED from the Fruit, and guaranted free from Artificial Essences.

ONE volume added to seven volumes of *Syrupus, B.P.*, forms the SYRUP OF LEMONS of the British Pharmacopœia.

Liquor Papaveris.

PREPARED from the Capsules of the White Poppy.

ONE volume added to seven volumes of *Syrupus, B.P.*, forms SYRUP OF POPPIES of full Pharmacopœia strength.

Liquor Rhei.

IN the manufacture of this preparation, only the finest East Indian Rhubarb is employed.

ONE volume added to seven volumes of *Syrupus, B.P.*, forms SYRUP OF RHUBARB of full Pharmacopœia strength.

Liquor Sennæ.

A fluid ounce of this preparation contains the soluble portion of four ounces of Senna.

ONE volume added to seven volumes of *Syrupus, B.P.*, forms SYRUP OF SENNA of full Pharmacopœia strength.

Liquor Tolutani.

PREPARED from the finest Tolu Balsam.

ONE volume added to seven volumes of *Syrupus, B.P.*, forms SYRUP OF TOLU of full Pharmacopœia strength.

The above are supplied in ½-lb. Bottles at 2/3 each, and in 1-lb. Bottles at 4/- each. Special quotations for large quantities.

On receipt of a Post Card, trial samples will be sent, carriage paid to any address.

Detailed List, containing prices and particulars of upwards of thirty different combinations, post free on application.

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Holloway, London, N.

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CAUTION.—MARK YOUR LINEN WITH

CRYSTAL PALACE BOND'S GOLD MEDAL MARKING INK.

No heating required.

By Official Appointment to the Queen and Court of Holland. Certificate of Merit signed H.R.H. Prince of Wales.

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5 GOLD MEDALS.

The First Order of Merit,
SILVER MEDAL,
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It is false as Reported by interested persons that we do NOT supply less than £100 Orders. Any quantity can be obtained.

To avoid spurious imitations, see that the words "**Daughter of the late JOHN BOND**" appear on the Labels. (*See that you get it*). The Academie Nationale Society of Manufactures and Commerce, Paris, have awarded me the Grand Diploma and Premier **GOLD MEDAL** for perfection in Marking Inks. *Extract from the "Academie Journal," April*, 1870: "We have tested fifty Marking Ink Makers' preparations since 1855, and pronounce this the most successful article."
Works: 75, Southgate Rd., London. *Shippers and others please send for Illustrated Price List. Free Carriage on parcels of £5 & upwards.*

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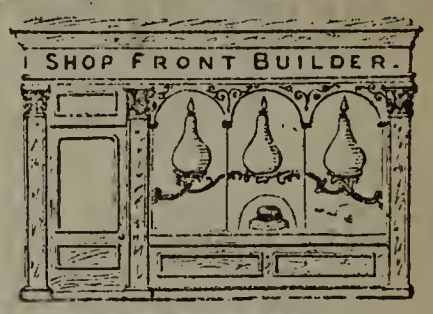
A few minutes' Ride by Omnibus from the Bank.



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Shops fitted by S. H., and to whom references are kindly permitted:—

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Mr. H. Deane, Clapham, London.	Messrs. Leath & Ross, St. Paul's Church Yd., London.	Mr. W. F. Smith, 280, Walworth Road, S.E.
„ John Broad, Rise House, Hornsey Rise, N.		„ Thomas Hall, Lowestoft.
Etc. Etc. Etc.	Etc. Etc. Etc.	Etc. Etc. Etc.

Cabinet Fitter to the Pharmaceutical Society of Great Britain. Manufacturer of every description of Air-tight Glass Show-Cases for Chemists, Jewellers, etc. Medical Labelling, etc. Plans and Estimates for Entire Fittings and Alterations supplied.

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NUBIAN LIQUID WATERPROOF BLACKING,

THE ORIGINAL AND SELF-SHINING. ☞ NO BRUSHES REQUIRED.

Easily applied with sponge attached to the cork. Keeps its polish for a week in all kinds of weather. Cleanest, Best, and Cheapest for Boots, Shoes, Harness, and all Leather Goods.

Price **1s.** and **2s.** per Bottle.

NUBIAN FURNITURE POLISH,

In Glass Bottles and Cartoons.

Easily applied with sponge attached to cork. Will not smear or clog, and produces a brilliant polish with little labour. Price **6d.**

LADIES' "PET" BOOT POLISH.

A Light Dressing for Ladies' and Children's Boots.

A Preparation which does not soil the most delicate clothing, and will not harden or crack the leather or peel off. Price **6d.** per Bottle.

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PATENT RECESS LABELLED SHOP ROUNDS. Parties about to Open New Establishments or Refit Old Premises, should compare following Net Prices. *These Prices include Glass Labels attached to Bottles ready for use.*

Size.	Height.	Flint Glass. N.M.	Flint Glass. W.M.	Blue Glass. N.M.	Blue Glass. W.M.	
16 ounce	8 inches	16/6	18/6	20/	22/	per dozen.
20 ,,	9 ,,	17/6	20/	21/	23/	,,
32 ounce	10½ inches	20/	22/	22/	26/6	per dozen.
42 ,,	11 ,,	22/	25/6	26/6	30/	,,

Prices of other Shop Bottles, &c., on application. *Sample Bottle sent on receipt of* 1s. 7d. *in stamps.* *Fac-Simile* sheet Labels, in various styles, sent on receipt of two stamps. *Amongst others, the following parties have recently been supplied with these Bottles:—*

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Blair, John, Cork
Brevis, John, West Hartlepool
Brumwell, H., Sutton, St. Helens
Brunton, W. W., South Kensington, London
Carruthers & Allan, Dumfries
Catford, O. W., Crewkerne, Somerset
Cullen & Co., South Norwood, London
Cummings Bros., Dundee
Day, J., Savile Town, Dewsbury
Gardner, A. W., Auckland, N.Z.
Gibbs, R. D., Smethwick
Keith, John, Kirkgate, Leeds
Kinninmont, A., Glasgow
Lodge, G. H., Rotherham.
Macfarlane, A. Y., Edinburgh
Mason, W. D., Grimsby
Maston, G., Hartlepool
McCaul, J. & G., Londonderry
McRae ,Alexander, Edinburgh
Morris, J. L., Moss Side, Manchester
Noble, A., Galashiels
Parsonson, T., Jersey
Pattison, H., Coleham, Shrewsbury
Quiray, W. D., Belfast
Rand, E., Wagga-Wagga, New South Wales
Senior, Harold, Norwood Lane, London, S.E.
Sibthorpe, S., Wolverhampton
Smith, Albert, Ilfracombe
Taylor, W. G., Hungerford
Walton, M. F., Sowerby Bridge
Waterhouse, A., Dewsbury
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The only preparation which does not injure the leather.

Produces a perfectly black and permanent gloss, which will not rub off even when wetted, nor soil the most delicate article of dress.

It is invaluable for Ladies' and Children's Boots and Shoes, Waist Belts, Travelling Bags, &c. Each bottle is neatly packed in a cardboard box, and contains a sponge mounted and ready for use: thus JETTINE may be applied without soiling the hands.

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PRIZE MEDAL 1862.

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These FATS, *being absolutely* PURE, *and free from* SALT, CHEMICALS, *or* WATER, *are*
SPECIALLY ADAPTED FOR
PHARMACEUTICAL, PERFUMERY, *and* CULINARY *purposes.*

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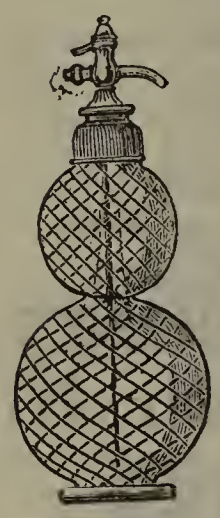

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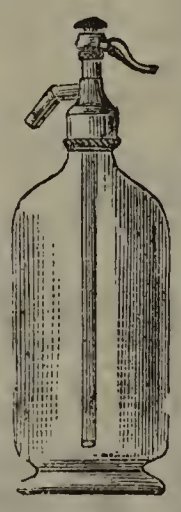

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Clear or coloured glass, viz., red, blue, green, or yellow, warranted pure ENGLISH BLOCK TIN TOPS, with piston or cap, 22s. 6d. *per dozen or* £13 10s. *for quantities of not less than one gross.* PACKING IN CASK 5s. PER GROSS.

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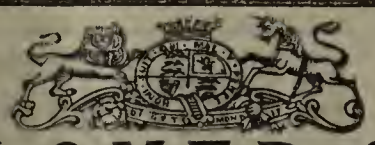

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"It is typical of what such a preparation should be; it is by far the best commercial soluble Essence I have yet seen, and I doubt the possibility of making a stronger or better."

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It is manufactured especially for sale by Chemists doing a family trade.

COMPARISONS ARE INVITED.

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See Chemist and Druggist, January last, page 33.

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A MONEY SAVING TEA. ABSOLUTELY PURE.
The small leaf from some of the finest India and China Teas. Produces a tea in the cup stronger, richer, and cheaper than most whole-leaf teas. Agents appointed, where unrepresented, throughout the United Kingdom.

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GOLD MEDAL, ADELAIDE, 1881.

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PREPARED only by WILLIAM DARLING, Chemist, Manchester. May be had from S. Maw, Son & Thompson; Barclay & Sons; F. Newbery & Sons; Sanger & Sons; and any Wholesale House in London. Price 2s. per Box, and Family Jars 10s. each.

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INDIAN TEA GROWERS' ASSOCIATION
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The object of the Planters who have formed this Association is to establish a business for the direct supply of Tea from the Plantations of the Kangra Valley to the public.

So great a success has attended the efforts of the promoters of the Association that it has become necessary that one of the Planters should reside in England to manage its affairs.

The distinctive feature of the business of this Association is that the Tea is delivered to consumers in the original One Pound tin-foil lined parcels in which it is packed in the Valley, and it is guaranteed to be absolutely pure.

Vide **Allen's Indian Mail**, Feb. 28, 1883:—"* * * We can speak from actual knowledge of the excellence of the Teas of the 'Kangra Valley Indian Tea Growers' Association,' and as in advertising them we are also benefiting those who take advantage of their enterprise, we append their modest prospectus, which promises no more than they are well able to perform."

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Messrs. BARCLAY & SONS, 95, Farringdon Street,

Agents to the Association, from whom Show Cards can be had on application.

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INDIAN MEDICAL SERVICE.

India Office, 22nd March, 1883.

NOTICE is hereby given, that an Examination of Candidates for five appointments as Surgeon in Her Majesty's Indian Medical Service will be held in London in August, 1883.

Copies of the Regulations for the Examination, together with information regarding the Pay and Retiring Allowances, &c., of Indian Medical Officers, may be obtained on application at the Military Department, India Office, London, S.W.

A further notice will be issued when the exact date of the examination has been fixed.

Allen Johnson, Major-General
Military Secretary.

THE

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Laboratory and School Buildings:

173, MARYLEBONE ROAD, N.W.

The last complete Course of Lectures and Classes of the present session will be commenced on Monday, April 23rd. Fee to the June examination, 6 Guineas; to July, 8 Guineas.

The Proprietors wish to draw the attention of Students to the advisability of attending a Course from its commencement, in order that a thorough knowledge of the subjects may be obtained.

For Prospectus, &c., apply to Messrs. LUFF & WOODLAND.

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FOURTEENTH SESSION, 1882-3.

A few benches remaining for the 3rd B Course, commencing April 14th. Fees, Syllabus, &c., apply to W. BAXTER, Secretary.

TO PHARMACEUTICAL STUDENTS

The next COMPETITION for the

Pattison Pharmaceutical Scholarship

Will be held on

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The holder is entitled to FREE EDUCATION in all the Branches for the Minor Examination.

For all particulars apply to Secretary, Edinburgh School of Pharmacy, Marshall Street, Nicolson Square, Edinburgh.

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The COURSE of LECTURES and CLASSES for the June and July Examinations will be commenced on FRIDAY, APRIL 27th.

In order to secure the comfort of Students during their stay in College, Mr. Wills provides a limited number of Students with Board and Lodging at his Private Residence, Gladstone House, St. George's Road, Southwark.

Terms, Four Guineas per Month.

FEES from April 27th.

(*Inclusive of Lectures, Classes, and Laboratory Instruction.*)

MAJOR or MINOR.

To the June Examination	£5 5s.
To the July ,, ...	£7 7s.
Until Qualified	£10 10s.
Major and Minor, Until Qualified	£15 15s.

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Students are quickly and thoroughly prepared for the above Examination. The next Course of Classes will commence on Monday, April 9th.

Students who are studying for their Preliminary should send for the EXAMINATION QUESTIONS given for April, 1883, with fully WORKED-OUT ANSWERS AND ESSAY. Price 6d., by post 6½d., or the Papers for January and April, 9d.

EVENING CLASSES for preparing Candidates for the Minor and Major Examinations are held on Tuesday and Thursday, from 7 to 9 p.m. **CLASSES** for Preliminary Students are held every Friday, from 7 to 9 p.m.

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For Students engaged in business are held daily:—Minor, at 10 a.m. and 7.30 p.m. on Tuesday, Wednesday, Thursday. Preparation for Minor and Preliminary privately and by post. Entrance for June, July and October examinations should be made without delay. Mr. JUDD'S Postal Classes, for either examination, Five Shillings per month. *Number* of lessons, lectures and examinations not limited. For Prospectus and particulars enclose stamp.

☞ For personal interview, call at the **CLASS ROOM, 15, Compton Street**, Brunswick Sq., W.C.

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MARSHALL STREET, NICOLSON SQUARE. *Established in* 1878.

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MANAGER. Minor qualification. Can Prescribe and Extract Teeth. Married. 16 years' varied experience. Acquainted with Postal duties. Disengaged end of April. M., 4, Ecclesbourne Villas, Parsons Mead, Croydon.

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AS JUNIOR in good Dispensing business. Age 21. 4½ years' experience. Height 5ft. 8in. Salary moderate. London or country. C. HARRIS, 45, Chobham Rd., Stratford, E.

AS ASSISTANT in a good Dispensing business. First-class experience and unexceptional reference. Age 27. Height 5ft. 11in. HUGH, 342, King's Rd., S.W.

LOCUM TENENS and TEMPORARY, &c.—R. E. BUNN'S (of 12, Unity Pl., Woolwich) present address is : Mr. LEWIS'S, Chemist, St. Albans, Herts. Terms, references, testimonials, &c., on application.

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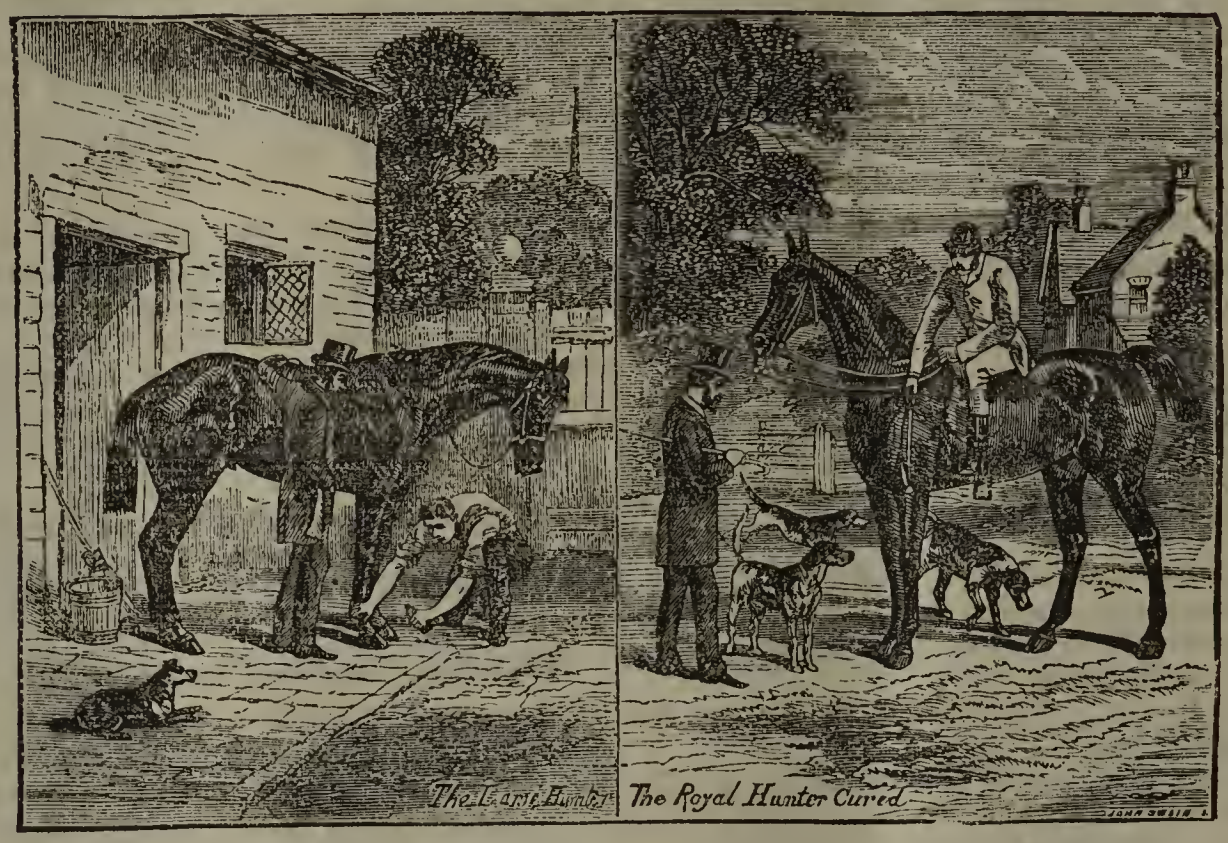

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February 1st, 1881.

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Athletic and Aquatic Editor S. L.

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The
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AND
Transactions.

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Pharmaceutical Society of Great Britain,

17, BLOOMSBURY SQUARE, LONDON.

ELIAS BREMRIDGE, Secretary and Registrar.

NOTICES.

SPECIAL NOTICE.

Monday, April 30th, is the last day on which the Secretary can receive Subscriptions.

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SECTION 1, CLAUSE 10.—"All Subscriptions for the Current Year shall become due upon election, and *all Annual Subscriptions shall become due on the first day of January in every year;* and if any Member, Associate, or Apprentice or Student shall not have paid his annual subscription before the first day of May in any year, his name shall be omitted from the Register of Members, Associates, and Apprentices or Students of the Society certified by the Council at the Annual Meeting."

SECTION 17, CLAUSE 3.—"Any Member or Associate, Apprentice or Student, desiring to retire from the Society, shall send notice thereof to the Secretary in writing, together with the Certificate or Diploma of Membership, if any, held by him. *No Member or Associate shall be released from his obligation to pay his annual subscription until such time as the Certificate or Diploma of Membership, if any, shall have been returned.*"

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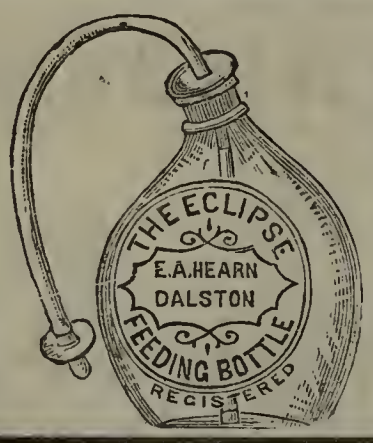

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The Practitioner of September, 1881, reports a lecture entitled "Recent Advances in the Therapeutics of Diseases of the Skin," by Professor W. A. JAMIESON, M.D., F.R.C.P. Ed. The following is an abstract therefrom :—"Itching, which owes its origin to too slow a current of blood, of which the most typical example is that seen in *Eczema* connected with varicose veins of the leg—but to the same category also many examples of Pruritus Scroti, Labiorum and Ani may be referred—is best relieved by careful flannel bandaging, well applied suspensory bandages, and laxative salts or mineral waters, which unload the rectal veins by freeing the portal circulation, combined locally with *weak tarry lotions*, one of the best of which is *Wright's Liquor Carbonis Detergens*, a well made *alcoholic solution of Coal Tar*, suitably diluted."

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See PHARM. JOURN., *March* 10, 1883.

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"New York Medical Journal," *August* 1880,
Dr. F. Weir,
in Lecture delivered to the College of Physicians and Surgeons, New York.

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THE NEW PHARMACOPŒIAS FOR THE UNITED STATES AND GERMANY.

(*Continued from page* 758.)

OLEUM AMYGDALÆ AMARÆ, U.S.P.—The oil, either in its crude state or freed from hydrocyanic acid, is official, since the sp. gr. is given for each; the former should be 1·060 to 1·070, and the latter 1·043 to 1·049. The distillate, obtained at a temperature of 80° C. (176° F.), should not have the odour or characteristics of chloroform or alcohol. The potash test for the presence of nitrobenzol is given.

OLEUM AMYGDALÆ EXPRESSUM, U.S.P.; OLEUM AMYGDALARUM, P.G.—The sp. gr. in both Pharmacopœias is almost identical. The U.S.P. states that the oil does not congeal until cooled to near −20° C.; the P.G. that it remains limpid at 10° C., and that when shaken with fuming nitric acid it should give, after some hours, a solid, white, not a brown or red mass, and an almost colourless liquid. This test excludes the use of peach kernel oil, which is said to be largely used in France as a substitute for almond oil. The U.S.P. states that when two drops of concentrated sulphuric acid are allowed to fall on about eight drops of almond oil on a white plate, the mixture should not assume a dark colour at the edge of the acid, and after stirring, the "mixture should not assume a dirty yellow colour, retaining its tint for several minutes."

OLEUM ANISI, U.S.P. and P.G.—Oil of *Pimpinella anisum* only is official in the P.G., but that of *Illicium anisatum* also in the U.S.P. The difference in the solubility of the two oils in proof spirit, pointed out by Mr. Bland (*Pharm. Journ.*, [3], xiii., p. 363), and the discrepancies likely to result from this cause in dispensing, render it desirable that only one oil should be official.

OLEUM AURANTII CORTICIS, U.S.P.—By a singular oversight (?) the botanical name of the orange to be used is not given, hence it is open to question whether the oil of the *Citrus Aurantium* ("essence de portugal") or the more valuable oil of *C. vulgaris* ("essence de bigarade") is intended. Under these circumstances the pharmacist who values his reputation will, of course, use the best variety. Its sp. gr. is given as about 0·860. The disagreeable terebinthinate taste which the oil acquires by keeping may be prevented by "mixing it while fresh with 5 per cent. of alcohol, and decanting the oil after it has become clear from the sediment."

OLEUM AURANTII FLORUM, U.S.P. and P.G.—The same remark as to the omission of the botanical source of the oil in the U.S.P. applies in this case, but in the P.G. it is attributed to *Citrus vulgaris*. It should be soluble in an equal quantity of alcohol, should exhibit a violet fluorescence when a little alcohol is poured on it and the fluid gently undulated (U.S.P. and P.G.), and a spirituous solution should be neutral to test paper (P.G.). The sp. gr. is given in the U.S.P. as 0·850 to 0·890. When pure the sp. gr. of *Ol. Neroli Bigarade* should be 0·899, according to Hanbury.

OLEUM CAJUPUTI, U.S.P. and P.G.—The P.G. gives *Melaleuca Leucadendron* as the botanical source of the oil, and the U.S.P. *M. Cajuputi*, Roxb. The latter gives the sp. gr. as 0·920. On shaking 5 c.c. of the oil with 5 c.c. of water and one drop of dilute hydrochloric acid, the oil should become decolourized (P.G.), nearly colourless (U.S.P.). When 1 part of iodine is mixed gradually with 5 parts of the oil and the mixture cooled, it should solidify to a crystalline mass (P.G.). This mass is easily decomposable.

OLEUM CARI, U.S.P.; OLEUM CARVI, P.G.—The U.S.P. gives the sp. gr. as 0·920. The P.G. orders the portion of oil obtainable from the fruits at a higher temperature, and, therefore, carvol. This does not appear to be in demand in Germany, but must of course be kept for dispensing. The question whether carvol or oleum carvi is to be used will therefore arise when old prescriptions containing oleum carvi have to be dispensed. It would have been better, therefore, that the name carvol should have been given to the fluid ordered in the P.G., of which the sp. gr. should be not less than 0·910. It should give a slightly violet or reddish colour with solution of perchloride of iron, and a white crystalline mass with alcoholic sulphide of ammonium.

OLEUM CARYOPHYLLI, U.S.P.; OLEUM CARYOPHYLLORUM, P.G.—The sp. gr. should be 1·050 (U.S.P.), or 1·041 to 1·060 (P.G.). According to the P.G. on adding a solution of perchloride of iron to water in which the oil has been shaken, it should not give a green or blue colour, indicating probably the presence of carbolic acid; if the oil be pure, a drop of the oil spread on the inner surface of a glass vessel, when the vapour of bromine is introduced, should become of a blue or violet colour. It should be miscible with an equal or larger quantity of spirit of wine.

OLEUM CINNAMOMI, U.S.P. and P.G.—The oil of cinnamon of the U.S.P. of course includes oil of cassia. The sp. gr. of the oil of Ceylon cinnamon is given as about 1·040, and that of Chinese cinnamon (oil of cassia) as about 1·060. The P.G. gives the sp. gr. (of Chinese cinnamon oil) as 1·055 to 1·065. The presence of carbolic acid is recognized by the test with perchloride of iron. No reference is made to the oil of cinnamon leaf, which has somewhat different odour from that of the bark.

OLEUM EUCALYPTI, U.S.P.—The oil may be derived from the fresh leaves of *E. globulus* or *E. amygdalina*, Labill., and some other species of *Eucalyptus*. The sp. gr. is given as 0·900. Muller (*Proc. Montreal Coll. Pharm.*, 1873, p. 28) gives the sp. gr. of *E. globulus* as 0·917, that of *E. amygdalina* as 0·881, and that of *E. oleosa* as 0·911, so that it would appear as if the oil from which this sp. gr. was taken was a mixed oil. Indeed, the oil of *E. globulus* until recently has generally been replaced with that of other species in commerce. For antiseptic purposes this is probably of little consequence; but if used internally, the difference in flavour of the different oils would, probably, be quickly detected by patients and lead to difficulties with the dispenser.

OLEUM FŒNICULI, U.S.P. and P.G.—The sp. gr. is given in both as 0·960. The clear spirituous solution should not be coloured by sesquichloride of iron (P.G.).

OLEUM GAULTHERIÆ, U.S.P.—The sp. gr. is given as 1·180. One of the adulterations commonly used, consisting of a mixture of chloroform and alcohol, is detected by the colourless distillate obtained at 80° C. (176° F.). The other, oil of sassafras, if present, gives a deep red colour when five drops of the adulterated oil are mixed with five

drops of nitric acid, and the mixture solidifies to a dark red resinous mass. Oil of wintergreen being the heaviest of the volatile oils, the sp. gr. alone serves as a guide to the detection of any admixture of other essential oils.

Oleum Gossypii Seminis, U.S.P.—It should be of a bright pale yellow colour, with a sp. gr. of 0·920 to 0·930. Concentrated sulphuric acid should instantly render it dark reddish-brown. The oil replaces olive oil in five of the official liniments. In the case of *Linimentum Calcis* the drying property of the oil might prove an advantage, but in the others oleum olivæ would probably be preferable so far as the comfort of the patient is concerned.

Oleum Hedeomæ, U.S.P.—The sp. gr. should be about 0·940. This oil, commonly known as American oil of pennyroyal, may be recognized by its sp. gr. (that of *Mentha Pulegium* being 0·927), and by dissolving iodine with an explosive reaction. In some persons it produces unpleasant symptoms, and the English oil is therefore to be preferred in this country.

Oleum Juniperi, U.S.P. and P.G.—The P.G. does not give the sp. gr. The U.S.P. states that it should be about 0·870, and that the oil should be soluble in about 12 parts of alcohol, forming a turbid liquid. The P.G. directs that a drop of the oil rubbed with sugar and shaken with 50 grams of water should not impart an acrid taste to the liquid. This test is probably intended to detect the cheaper oil prepared from the tops or wood of the plant. The P.G. remarks also that the oil is but little soluble in spirit, but forms a clear mixture with bisulphide of carbon. The solubility and specific gravity of the oil depend upon age and upon whether the oil is derived from unripe or ripe berries (*Pharm. Journ.*, [3], viii., 887), but in neither Pharmacopœia is any direction given as to the age of the fruit to be employed.

Oleum Lavandulæ, U.S.P. and P.G.—It should not give evidence of alcohol, and the sp. gr. should be about 0·890 (U.S.P.), 0·885 to 0·895 (P.G.).

Oleum Limonis, U.S.P.; Oleum Citri, P.G.—The U.S.P. states that it should be soluble in 2 parts of alcohol and have a sp. gr. of about 0·850, and should be soluble in all proportions in absolute alcohol or disulphide of carbon. The addition of 5 per cent. of alcohol to the oil when fresh and decantation after a sediment has been deposited is recommended to prevent it from acquiring a terebinthinate taste. The P.G. directs that it should not yield alcohol on distillation.

Oleum Menthæ Piperitæ, U.S.P. and P.G.—The test given in the U.S.P. of the solubility in an equal weight of alcohol, and in the P.G. of its forming a clear mixture under these circumstances, as well as the test of not becoming heated when powdered iodine is moistened with it, would appear to be intended to exclude the American oil, which is said to explode with iodine and to form a turbid mixture with alcohol (*Pharm. Journ.*, [3], ii., 338). The American oil also has usually a sp. gr. of 0·85 to 0·86, while that ordered in the P.G. is 0·90 to 0·91, and in the U.S.P. 0·90. No test is given for the presence of castor oil (*Pharm. Journ.*, [3], ii., p. 981) or for other known occasional adulterants of oil of peppermint. Now that Japanese oil is a marketable article, a test for its detection if used as an adulterant might be useful.

(*To be continued.*)

NOTE ON DRIED ALUM.*

BY E. BAILEY,

Bell Scholar in the School of Pharmacy of the Pharmaceutical Society.

[Contribution from the Research Fund of the School of Pharmacy Students' Association.]

So many different and conflicting opinions have from time to time been put forward as to the use and solubility of the alumen exsiccatum of the Pharmacopœia, that, after reading the evidence on both sides, one is left in considerable doubt as to which is most worthy of credence. For instance, in the *Pharmaceutical Journal* for November 26, 1870, Dr. Tilden states that "dried alum is nearly insoluble in water, but recovers its solubility by long boiling." Similar remarks are made in Watt's 'Dictionary of Chemistry' and other works. On the other hand, several well-known books, among which I may mention Roscoe and Schorlemmer's 'Treatise on Chemistry,' speak of it as a porous mass, slowly but entirely dissolving in water. It was with a view to investigating the truth as regards these statements, and ascertaining whether alum can be thoroughly dried without the occurrence of an insoluble residue, that the experiments were made of which the following is a brief report.

In the first place samples were obtained from a dozen different sources. These all differed considerably in appearance, degrees of fineness, colour, and also, as will be seen, in solubility. A commencement was made by dissolving, as far as possible, 2 grams from each sample in 50 c.c. of cold water, filtering the solution and washing till the filtrate ceased to give a precipitate with chloride of barium. The following table shows the result of the process:—

	Percentage of residue insoluble in cold water.
No. 1	2·5.
„ 2	6·5.
„ 3	5·5.
„ 4	·5.
„ 5	1·0.
„ 6	6·5.
„ 7	·5.
„ 8	None.
„ 9	None.
„ 10	3·5.
„ 11	2·0.
„ 12	5·5.

The insoluble residue consisted of oxysulphate of aluminium. As all the samples had absorbed more or less water, the above percentages may perhaps be placed somewhat higher than they have been given; but, even allowing for this, it is obviously a mistake to speak of the dried alum of the Pharmacopœia as being "nearly, if not quite, insoluble in water." Moreover, the effect of "continued boiling" is not to render the dried salt more soluble; but, on the contrary, to decompose it and cause the deposition of more insoluble matter than is the case when cold water is employed; thus, a sample which, with cold water, yielded 5·5 per cent. of insoluble residue, yielded, after boiling for four hours, as much as 17 per cent.

When the difference thus presented by various commercial samples is considered, we are driven to conclude either that those which were entirely

* Read before the School of Pharmacy Students' Association.

soluble had never been thoroughly dried, or that those which yielded an insoluble residue had been heated above the requisite temperature; my next object, therefore, was to prove which of these suppositions was correct.

Little or no trustworthy information on this point could be obtained by further drying, for dried alum rapidly absorbs moisture from the air; hence it was impossible to say whether the loss in weight on heating was entirely due to water absorbed after drying, or whether any of it had existed in the salt as water of crystallization. Therefore the effect of different temperatures upon ordinary commercial alum was tried, and the following results were obtained. One gram was first as far as possible dried over a water-bath; this heat was found only sufficient to expel three-fourths of the water, the residue weighing ·64 gram. At 240° F. the alum lost four-tenths of its original weight, about 7 per cent. of water being still left in combination with the salt. After drying at the maximum temperature allowed by the Pharmacopœia, viz., 400° F., the sample, upon examination, was found to have lost all its water of crystallization, and at the same time yielded a residue that was entirely soluble in water. With care I have been able to expel all water at temperatures below 400°, but since the products do not differ in composition, no advantage is gained by proceeding thus, while the time occupied is considerably longer. After several experiments, the conclusion arrived at is that when the directions of the Pharmacopœia are carefully followed, a good soluble product, answering all requirements, is always obtained.

It is, therefore, quite evident that dried alum ought always to be freely (though slowly) soluble in water, and that, when this is not the case, the insolubility of the product is caused by carelessness in the mode of preparation.

Having performed the above experiments I was still at a loss to account for the conflicting statements in chemical works alluded to at the outset; for, although the experiments proved that some of the samples must have been dried above the proper temperature, yet even these yielded only a comparatively small residue of insoluble matter, by far the greater part entering readily into solution. However, on referring to former Pharmacopœias, an explanation of the cause of the mistake was soon discovered, for I find that the methods of proceeding used to be as follows. The first quotation is from the London Pharmacopœia of 1788:—"Take alum, ℥ a pound, burn it in an earthen vessel so long as it bubbles." The compilers of the Pharmacopœia for 1836, having more regard for technical phraseology, give this direction: "Let alum melt in an earthen vessel over the fire, then let the fire be increased until the ebullition has ceased." Here, though the wording is altered, the sense is evidently the same, and in the Pharmacopœia of 1851 similar instructions are laid down. When thus prepared, dried alum is not only "nearly," but altogether insoluble in water, for, on proceeding in the above manner, the residue obtained consisted principally of oxide of aluminium.

From the results of the above experiments the following facts may, in short, be deduced. Dried alum of the Pharmacopœia should be entirely soluble in cold water. As a rule, among commercial specimens this is not the case, some insoluble matter being generally found, the occurrence of which is due to the employment of too much heat in its manufacture. This residue consists chiefly of oxysulphate of aluminium, and varies from ½ to 10 per cent. of the whole mass.

In conclusion, I may state that only one of the above samples contained ammonium, the rest being sulphate of aluminium and potassium, and, on making inquiries I was informed that this solitary exception had been in stock for several years and was consequently no guide to the constitution of alum at the present time. To this extent, therefore, I can confirm what has been stated by others, namely, that potassium alum has quite replaced the ammonium alum ordered in the Pharmacopœia.

TURMERIC OIL—TURMEROL.*

BY C. L. JACKSON AND A. E. MENKE.

This oil, to which turmeric (and therefore curry-powder) owes its aromatic taste and smell, was extracted from Bengal turmeric with light petroleum, and after being freed from the higher-boiling portion of that solvent by heating to 150° in a flask, formed a thickish oily yellow liquid having a pleasant aromatic odour. It was purified by fractional distillation under diminished pressure, and was thereby separated into three portions, the first boiling below 193°, the second at 193–198°, and the third consisting of a viscous semi-solid residue. The middle portion consisted of nearly pure turmerol; the first, of that compound contaminated with hydrocarbons from the petroleum. The middle fraction, after further purification by distillation in a vacuum, gave, as a mean result of several analyses, 83·62 per cent. carbon and 10·42 hydrogen, agreeing nearly with the formula $C_{19}H_{28}O$, which requires 83·81 C. and 10·29 H.

Turmerol is a pale yellow oil having a pleasant, moderately strong aromatic smell, and a density of 0·9016 at 17°. It is optically dextrogyrate, $[\alpha]_0 = 33·52$. Under ordinary pressure it boils at 285–290°, but decomposes at the same time, yielding a substance of lower boiling point. Under 60 mm. it boils at 193–198°, still, however, with slight decomposition. It is essentially insoluble in water, but mixes readily with all other ordinary solvents. It does not unite with acid sodium sulphite.

Turmerol is an alcohol, and is converted by heating at 150° with strong hydrochloric acid into turmeryl chloride, $C_{19}H_{27}Cl$, which is a pale brownish fragrant oil decomposed by distillation. The same compound is formed, but less definitely, by treating turmerol with phosphorus trichlorlde; the pentachloride appears to act partly in the same manner, but at the same time to add chlorine. By treating turmeryl chloride with boiling water, and with alcoholic solution of sodium acetate, potassium cyanide, or ammonia, substances are obtained having the characteristic odours of the classes to which they belong, but they have not yet been obtained pure. Turmerol treated with sodium yields a semi-solid mass having the composition of *sodium turmerylate*, $C_{19}H_{27}ONa$.

Isobutyl turmerylate, $C_{19}H_{27}.OC_4H_9$, prepared by boiling the sodium compound with isobutyl iodide in a reflux apparatus, is a heavy yellowish fragrant oil. The *ethylic ether* is a similar substance.

Oxidation of Turmerol.—By the action of a hot aqueous solution of potassium permanganate in excess, turmerol is oxidized to terephthalic acid. With a cold solution of the same salt, not in excess, it appears to yield some new acids, with the study of which the authors are at present occupied.

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* From the *Amer. Chem. Journ.*, iv., 368–374. Reprinted from the *Journal of the Chemical Society*, April, 1883.

THE EXPLOSIVE POWERS OF NITRO-GLYCERINE AND DYNAMITE.

The following information as to the extent of the destructive effects following the explosion of nitro-glycerine and dynamite has been supplied by Mr. G. M. Roberts, F.C.S., the Technical Manager for Nobel's Explosives Company, Limited, in a letter that appeared in the *Times* on Wednesday last:—

"I observe that exaggerated statements as to the destructive effects of exploded nitro-glycerine and dynamite have appeared in the newspapers. As those statements are likely to produce unnecessary alarm and augment the prevailing "scare," it may be well to reassure the public somewhat by giving them, instead of the grossly exaggerated assertions that have appeared, exact figures from which they will be able to judge how very little cause there is for alarm. Nitro-glycerine and dynamite do not when exploded, exert such a force as is popularly believed. To speak precisely, the power developed by the explosion of a ton of dynamite is equal to 45,675 tons raised one foot, or 45,675 foot-tons. One ton of nitro-glycerine similarly exploded will exert a power of 64,452 foot-tons, and one ton of blasting gelatine, similarly exploded, 71,050 foot-tons. These figures although large, are not enormous, and need not excite terror. Seventy-one thousand tons of ordinary building stone, if arranged in the form of a cube, would measure only 96 feet on the side, and if it were possible to concentrate the whole force of a ton of blasting gelatine at the moment of explosion on such a mass, the only effect would be to lift it to the height of a foot. The foregoing figures are derived from experiments made at Ardeer with an instrument which gives accurate results in measuring the force of explosives. The power exerted by an explosion on surrounding objects is in the inverse ratio of the cube of the distance from the point of explosion. Thus, at 100 feet from the exact point of an explosion, the power is only the cube of $\frac{1}{100}$, or $\frac{1}{1000000}$th part of what it is at a distance of only one foot from that point; or, in other words, if the power at one foot from the spot be represented by 1,000,000, at the distance of 100 feet it will be but 1. It is thus seen that the effects are intensely local, but comparatively trifling at even short distances. If a ton of dynamite or nitro-glycerine were exploded in a London street the effects would be felt severely in the immediate neighbourhood only of the explosion, and beyond that they would be confined to the mere breakage of windows. Indeed, it would be impossible by a single explosion, however large, to do damage to any considerable extent beyond the immediate neighbourhood in which the explosion took place. On one occasion I happened to witness the explosion of over a ton of nitro-glycerine from a distance of only 60 yards. The nitro-glycerine was about 10 feet beneath the level of the ground, which was of sand and covered with water. Beyond the breakage of windows, and the bursting of a few doors in the surrounding buildings, there was no damage done. A little sand was thrown over me, but I received no personal injury. Vague statements have been from time to time promulgated to induce the belief that there are stronger explosives than nitro-glycerine and nitro-glycerine preparations, and that the wretched men who have been guilty of the late attempts on public buildings, etc., are in possession of more powerful explosives than any known to chemists. The public may rest assured that such is not the case. Nitro-glycerine and its preparations form the strongest explosives yet known. The strongest of these is the material known as blasting gelatine. It consists of nitro-glycerine combined with a certain proportion of nitrated cotton. It is much more difficult to prepare than either nitro-glycerine or dynamite, and cannot be made by unskilled persons. If the power of dynamite be represented by 1000, that of nitro-glycerine will be 1411, and of blasting gelatine 1555.

"The 1½ cwt. of nitro-glycerine seized by the police the other day would, if exploded, exert a force of only 4833 foot-tons, and if converted into dynamite, it would represent a force of only 4567 foot-tons. The conversion of nitro-glycerine into dynamite reduces the power of the former, but renders it more easy and safe to handle and use. The power given above is comparatively insignificant, and as it is the maximum effect that could be produced under the most favourable circumstances on the very spot of explosion, it never could be obtained in practice. It is, therefore, absurd to say, as was said the other day in a London paper, that the explosion of such a quantity of nitro-glycerine would blow up the whole of London. In fact, the explosion could scarcely be heard over London, and the damage done by it would be strictly local.

"I have often, by way of experiment, exploded a pound of dynamite suspended from the end of a fishing rod by string of about 6 feet long, holding the rod in my hand the while. As there was no solid matter to project I received no injury, and the end of the fishing rod was not even scratched. About 3 feet of the string at the end of the rod was always left uninjured.

"It will be seen from the foregoing that the scoundrels who attempt to destroy public buildings are powerless to do much harm by their operations. They cannot by any means at their disposal lay a whole city in ruins—not even a street. They may injure special buildings, but that is the most they can do."

KHAT, CAFTA, OR ARABIAN TEA.*

With the Arabs *Catha edulis* is a plant of some importance, inasmuch as it furnishes them with one of the necessities of life in every country, namely, tea. What the leaves of *Camellia Thea* are to us, those of *Catha edulis* are to them. The plant is of a shrubby nature, growing about ten feet high, with smooth, elliptical, serrate leaves, two or more inches long, and about an inch wide. They are peculiar in being arranged on some branches opposite to each other, and on others alternate. The flowers are small and white. The plant is largely cultivated in the interior of Arabia, mostly in gardens along with coffee. For the purposes of commerce, the twigs, with the leaves attached, are gathered and carefully dried; they are made up into closely pressed bundles of different sizes, the quality being known by the form and size of the bundles, the best of which are about a foot or fifteen inches long, and three inches wide; about forty slender twigs compose these bundles, which are tied together with strips of bark. The bundles are sent into Aden from the place of cultivation in the interior of Arabia in very large quantities, and sell at an average price for good quality of about two annas per bundle. The use of this tea in Arabia is said to antedate that of coffee; the effects of its use are described as similar to those of strong Chinese green tea. In consequence of its stimulating effects khat was at one time classed by the people as an intoxicant; the use of intoxicating substances being forbidden by the Koran, this fell under condemnation. A synod of learned Mussulmans, however, made a decree that, as it neither injured the health nor hindered the proper observance of religious duties, but simply increased good-humour and hilarity, it was perfectly lawful to use it. Besides the use of the leaves in the preparation of a beverage, the Arabs also chew them both in the green and dried state, the effect of which is to increase the flow of hilarity or mirth, and to produce extreme wakefulness and watchfulness, so that a man may fulfil the duties of sentry all night without a feeling of drowsiness, an effect somewhat similar to that produced by cocoa. The plant is considered by the Arabs as an antidote to the plague, and they also say that infection cannot be contracted if a twig is carried about on the person. About three hundred camel-loads are brought into Aden in the course of a year.

* From the *Indian Agriculturist*. Reprinted from the *Produce Markets Review*, March 24, 1883.

The Pharmaceutical Journal.

SATURDAY, APRIL 14, 1883.

Communications for the Editorial department of the Journal, books for review, etc. should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

PATENT MEDICINES.

WE have so frequently drawn attention to the various evils resulting from the popular faith in secret remedies, and from the support afforded to their use by the apparent authorization given to them under the existing system of Government stamping and licences, that it would be superfluous to say more upon the subject from this general point of view than to reiterate the opinion already expressed, both in these pages and in those of our medical contemporaries, that the conditions under which the trade in so-called patent medicines or specifics for the cure of disease is carried on constitute an anachronism inconsistent with the advanced state of the arts of medicine and pharmacy. So far as human credulity is concerned in furnishing favourable opportunity for the continuance of this trade, it is probable that little can be hoped for in the way of counteracting the specious recommendations with which secret nostrums are brought under the notice of the public; but there is another circumstance to which these articles owe much of the appreciation they possess that certainly admits of being dealt with to that end. We refer to the relation existing between the trade in "patent medicines" and the State. A certain amount of revenue is derived from the sale of patent medicines, insignificant from a fiscal point of view, but productive of a mischievous influence, inasmuch as the Government stamp which represents it lends to patent medicines the appearance of having the recognition and sanction of the State for being what they profess. That such a state of things is out of accord with modern enlightenment is, we think, a strong reason for doing away with patent medicine stamps altogether, and in support of this view we may refer to the reply sent some time ago by the German government to an application from the United States government for information as to the number of patent medicines and the extent to which they were sold in Germany. This reply was to the effect that Germany being now a civilized country, patent medicines had no existence in it.

There is, however, a particular class of "patent medicines" which claim especial consideration in regard to the facilities given for their sale and to the implied recommendation of their use, by reason of their bearing the government stamp, viz., those containing powerful poisons or potent drugs. Without raising the question whether preparations of this class do or do not come within the exemption of the Pharmacy Act in regard to the trade in "patent medicines," there can be no doubt that the sale of such preparations without proper precautionary labels is a breach of the spirit of that Act in so far as it was intended to provide for the safety of the public.

Our readers will not need to be reminded that in the draft of a Pharmacy Acts Amendment Bill, now under consideration by the Privy Council, this particular aspect of the patent medicine trade has met with attention, and that in accordance with numerous expressions of opinion on the part of medical men and others it has been proposed to enforce the use of poison labels for patent medicines containing potent drugs, and thus to reduce the risk attendant upon their use. Having regard to the forcible terms in which the necessity for such a step has been spoken of in the medical press we cannot imagine that this proposition will be disregarded. Not long since the *Lancet*, in referring to the numerous fatal results of indiscriminate sale of poisons in the form of patent medicines, did not hesitate to speak of "the revenue derived from the sale of stamps" for such articles as the "price of blood" and of the entire question of patent medicines as calling urgently for legislative revision.

In the current number of *Macmillan's Magazine*, Dr. H. W. HUBBARD again treats of this subject, and directs attention to the anomalous character of the law relating to patent medicines, its inconsistency with the provisions of the Pharmacy Act, and the disastrous effects of the system under which potent drugs can be obtained and employed without any knowledge of their deleterious characters. After instancing cases attended with fatal results that have come within his observation, Dr. HUBBARD remarks that "many of these medicines, though composed "of the most potent poisons of the Pharmacopœia, "are sold indiscriminately to the public from grocery "and provision stores. They are constantly proving "treacherous pitfalls to robust adults as well as to "tender infants. Being so easily obtainable, they "largely facilitate the development of the pernicious "practices and enslaving habits of chloral and opium "taking, now so common in the under currents "of the domestic life of these times."

This subject is capable of assuming a still more serious aspect, for as Dr. HUBBARD remarks, when deaths ensue as a consequence of overdoses of secret compounds, the potency and dangerous nature of which are known only to the proprietary compounders of them, such deaths can hardly come within the conditions of "circumspection" and "moderation" which BLACKSTONE had in view when defining "excusable homicide" or "death by misadventure."

As regards the position of the State in relation to the trade thus represented, Dr. HUBBARD adds that "the one requirement is the exhibition of the stamp certifying the Government duty," and it may therefore be well to place beside his comments a statement that the revenue derived from the patent medicine trade, according to official returns for the year ending 31st March, 1881, amounted to only £144,451 8*s.* 10½*d.*

We cannot altogether agree with Dr. HUBBARD'S comment upon this comparison where he says that "legislation enacted for the purpose of gaining "revenue to the State at the risk of health and life "of the community can hardly be considered the "highest class of statesmanship;" for though the influence of the law to which he refers is pernicious at the present time, the statesmanship which sanctioned its enactment is not necessarily chargeable with defect. The true view to take is that the law having become effete and inapplicable to modern conditions, it presents itself as fitting material to contribute by its repeal to the domestic legislation of the present.

ELECTRIC LIGHTING.

IN the fourth of the series of lectures on the applications of electricity, now in course of delivery before the members of the Institute of Civil Engineers, Dr. JOHN HOPKINSON, F.R.S., dealt with "Some Points in Electric Lighting." Dividing his subject into two parts—the methods of production of electric currents and the method of conversion of the energy of those currents into heat at such a temperature as to be given off in radiations to which the eye is sensible—the lecturer proceeded to point out that electrical phenomena are essentially mechanical in form and closely related with mechanical laws. Thus the terms "potential," "current" and "resistance" have close analogues in "head," "rate of flow" and "co-efficient of friction" in the hydraulic transmission of power. In hydraulics "head" multiplied by "velocity of flow" is power measurable in foot-pounds per second or horse-power; in a similar manner "potential" multiplied by "current" is power measurable in the same units. Again, just as water in a pipe has inertia and requires an expenditure of work to set it in motion, and is capable of producing disruptive effects if that motion be too suddenly arrested, so a current of electricity in a wire has inertia requiring the work of electromotive force for a finite time to set it in motion, and if arrested suddenly by breaking the circuit the electricity forces its way across the interval as a spark. Whilst, however, the inertia of water in a pipe is confined to the water, the inertia of the electric current resides in the surrounding medium, and this gives rise to the phenomena of induction of currents upon currents and of magnets upon moving conductors, which have no immediate analogues in hydraulics.

The laws upon which the action of dynamo-electric machines is based have been the subject of successive discoveries. OERSTED first found that an electro current in a conductor exerts force upon a magnet; and AMPÈRE, that two conductors conveying currents generally exert a mechanical force upon each other. But the most important was the discovery of FARADAY, that when a closed conductor moves in a magnetic field, a current is induced in it, in one direction if the number of lines of magnetic force passing through it are increased by the movement, and in the other if they are diminished. Since the dynamo-machine consists essentially of a conductor made to move in a magnetic field, the variation in the direction of current, due to the above cause, furnishes the explanation of the action in the alternating current machine. Alternating current machines cannot be worked in series, but they can be worked in parallel circuit, and are, therefore, quite suitable for the distribution of electricity without the necessity of providing a separate circuit for each machine. In the continuous current machine a commutator revolving with the armature is so arranged as to reverse the connection between the armature and the external current just at the point where the current would reverse; but though it is possible in this way to obtain a current constant in direction, such a current is not constant in intensity. The irregularity may, however, be reduced to any extent by multiplying the wires of the armature, giving each its own connection with the outer circuit and so placing them that the electromotive force attains a maximum successively in the several coils. A practically uniform electric current was first commercially produced with the ring armature of PACINOTTI as perfected by GRAMME.

A dynamo-machine is not a perfect instrument for converting mechanical energy into electricity, certain losses inevitably occurring. The properties of a machine depend very much upon its dimensions, and were there no disturbing influences it would appear, judging from known data, that a large machine is capable of doing thirty-two times the work done by one half its size. But practically no such result is obtained, for many reasons, and it may be briefly stated—(1) that the capacity of similar dynamo machines is pretty nearly proportionate to their weight, that is, to the cube of their linear dimensions; (2) that the work wasted in producing the magnetic fluid is directly as the linear dimensions; and (3) that the work wasted in heating the armature consequent upon its electrical resistance is as the square of the linear dimensions.

In dealing with the second part of his subject, Dr. HOPKINSON referred mainly to incandescence lamps, the Institution having been temporarily lighted with about 230 EDISON lamps. The electrical properties of such a lamp were discussed, and in particular it was shown that its efficiency increases and its resistance diminishes with increase

of current. One of the advantages presented by the incandescence lamp is the smaller amount of heat communicated to the atmosphere as compared with a gas flame. The light equal to sixteen candles given by each lamp used was described as being produced by 75 Watts of power developed in the lamp; to produce the same amount of light in good flat-flamed gas-burners would require between 7 and 8 cubic feet of gas per hour, contributing heat to the atmosphere at the rate of 3,400,000 ft.-lbs. per hour, equivalent to 1250 Watts, or nearly seventeen times as much heat as the incandescence lamp of equal lighting power.

At the present time, Dr. HOPKINSON is of opinion, lighting by electricity in London, using incandescence lamps, must cost something more than lighting by gas. Neither is there much prospect of reduction of cost in the direction of the engine and boiler or of the dynamo-machine, except so far as the prime cost of the latter may become less. Any hope of considerably increased economy must be based upon probable improvements in the incandescence lamp itself. It has been shown that marked economy of power can be obtained by working the lamp at high pressure, but this is done at the expense of its permanence, the filament soon giving way under the strain. Ordinarily each horse-power is made to produce light equal to from 140 to 200 candles from incandescence lamps, but the same amount of power is capable of producing from them, for a short time, light equal to 1000 candles. The problem then is so to improve the lamp in its details that it may last a reasonable time when pressed to this degree of efficiency. If this improvement could be realized, the cost of electric lighting by incandescence lamps would be reduced to one-fifth of what it now is.

It might seem at first sight superfluous to say anything in these columns as to the Explosive Substances Act which Parliament, at the request of the Government, has just passed with very unusual speed. Some of the provisions of the Act are, however, so far reaching that a word of caution may be useful in helping some of our readers to avoid being unwittingly drawn into a position where they may meet with much inconvenience and annoyance. Under the fifth section of the Act any person who, by the providing of premises or the supply of materials, aids, abets, or is accessory to a crime under the Act will be guilty of felony. It is, therefore, easy to conceive of conditions, as for instance where by means of invoices or labels the source of certain "materials" may be identified or suspected, a perfectly legitimate business transaction may be productive of a considerable amount of inconvenience and annoyance to the unwitting seller.

* * *

The Pharmacy Board of New Zealand appears to have recently issued a circular setting out the qualifications at present recognised by the Board for registration under the New Zealand Pharmacy Act of 1880, the fourth clause of which circular reads as follows:—"Any person who holds a certificate or diploma of competency, as pharmaceutical chemist, from the Pharmaceutical Society of Great Britain." The editor of the journal issued under the direction of the Pharmaceutical Society of Victoria, commenting upon this clause, remarks that it would appear from it that "the Minor examination of Great Britain (chemist and druggist) is not accepted." In order, therefore, to prevent any further misconception arising through the incomplete statement in this circular it will be as well to point out at once that under the existing law the New Zealand Pharmacy Board has no power to refuse it. In the 3rd sub-section of the 19th section of the Pharmacy Act for New Zealand, 1880 (*Pharm. Journ.*, x., 402) it is definitely enacted that any person who "holds a certificate or diploma of competency as a pharmaceutical chemist, *or as a chemist and druggist*, . . . from the Pharmaceutical Society of Great Britain, . . . shall be entitled to be registered as a pharmaceutical chemist without being subjected to examination." The justice of this will be seen when the fact is recalled that in this colony there is only one examination, the passing of which qualifies for registration as "pharmaceutical chemist." On the other hand it may be remarked that only such persons as have passed the qualifying examination in this country will be in a position to present certificates or diplomas of competency from the Pharmaceutical Society of Great Britain.

* * *

The Executive Committee entrusted with carrying out the arrangements for the International Pharmaceutical Exhibition, to be held in Vienna in August next, has established in Paris, at 39, Rue Rodier, a branch office for the States of Western Europe. The accredited agent is Herr Maximilian Leucht.

* * *

At the meeting of the Chemists' Assistants' Association on Wednesday evening next, the adjourned discussion upon Mr. Giles's paper on "Pharmaceutical Politics"—a portion of which is printed in this number of the Journal—will be resumed. It is anticipated that a resolution will be proposed expressing approval of the draft Pharmacy Acts Amendment Bill.

* * *

In like manner the late hour at which Mr. Frazer concluded the delivery of his lecture on "The Proposed Changes in the Pharmacy Act of 1868 and in the Educational System of the Pharmaceutical Society" at Glasgow on Wednesday evening last—a portion of which also appears in the present number—necessitated the postponement of the discussion. It is expected that a General Meeting of Chemists and Druggists in Glasgow and the West of Scotland will be held on an early day for the purpose of affording an opportunity for an expression of opinion on the subject.

* * *

At the meeting of the Chemical Society on Thursday next there will be a ballot for the election of Fellows, and a note by Mr. L. Thorne will be read on "An Apparatus for Fractional Distillation under Reduced Pressures."

Pharmaceutical Society of Ireland.

MEETING OF THE COUNCIL.

The monthly meeting of the Council of this Society was held on Wednesday, April 4, in the College of Physicians, Dublin, at three o'clock. The Vice-President, Dr. Aquilla Smith, presided.

The other members of the Council present were:—Messrs. Allen, Bennett, Brunker, Dr. Collins, Messrs. Grindley, Hayes, Sir George Owens, Mr. Wells and Dr. Whitaker.

Mr. Hugh Fennell, the Registrar, read the minutes of the last meeting, which were confirmed.

Mr. Fennell read a letter from Mr. Hatchell Whitby, 61, South Great Georges Street, asking what arrangements had been made for the meeting of a joint committee of four members of the Society and four of the Council, which had been appointed in pursuance of a resolution moved by him, to report to the Council on the best means of improving the prospects of the Society.

Mr. Brunker: That committee is waiting for his action in the matter.

Mr. Wells: There was a letter from him stating that he could not do anything in the matter himself.

Mr. Fennell: The committee were named at the Annual Meeting.

Mr. Brunker: And Mr. Whitby was written to, asking him to name the members of the Society not on the Council who were to confer with the members of the committee representing the Council. He declined to do so, and there the matter rests.

At the request of members, Mr. Fennell read from the minutes a record that a letter, dated November 29, had been received from Mr. Whitby, stating that he could not undertake to arrange for the meeting of the committee.

Mr. Allen: I understood that the matter was to be to a great extent left in his hands.

The Chairman: Let Mr. Fennell inform him that the Council did not take any action in the matter in consequence of his letter of November 29. The matter originated with him and it is not for the Council to help him. Let him take his own course.

Dr. Whitaker: The committee is still in existence.

Mr. Fennell was directed to write to Mr. Whitby in accordance with the suggestion of the Chairman.

A report from the Law Committee was read.

The Chairman remarked that the cost of two prosecutions carried out by the Society last year amounted to £29 3*s.* 2*d.*, and only £3 was received by the Society as a fine in one of the cases.

Mr. Wells: But you gained a very substantial advantage.

Dr. Whitaker: The money was well spent in sustaining a principle.

Dr. Collins said there was an instance in which a prosecution had cost the Apothecaries' Hall of Ireland £125, out of which they got £24 or £25.

Dr. Whitaker said it appeared to him that prosecutions could be more readily and inexpensively conducted in Dublin than in the country.

Mr. Wells: If you do not protect the members of the Society you will have no members shortly.

Mr. Brunker: The great excuse which licentiates make for not being members of the Society is, that we are not putting a stop to illegal dispensing. We reply that we cannot do it because they will not give us funds. We have 219 licentiates and 61 subscribing members.

Mr. Wells: You will get a great many more members if you show them something for their money. If it be a general complaint that you do nothing for the licentiates, they will not subscribe.

On the motion of Mr. Wells, seconded by Dr. Whitaker, the report was adopted.

A report of the Certificate Committee, containing the following passage was read:—"The declaration of Mr. John P. Middleton, brought before the Committee, having been substituted by a certificate, could not be entertained by them. The certificate is signed by Mr. G. H. Grindley, M.P.S.I., representing himself as 'late managing partner of the firm of Brooks and Co., 136, Lower Baggot Street.' The certificate goes to show that Mr. Middleton was for five years engaged with the firm. The Committee cannot undertake the responsibility of declaring that Mr. Grindley was a pharmaceutical chemist legally keeping open shop for the dispensing of prescriptions in the sense of the regulation on page 55 of the Society's Calendar for 1883, he being associated with an unqualified partner in the business."

Mr. Brunker: The position of the firm referred to is analogous to that of another in respect of which a prosecution is to be undertaken. We are not prepared to say that the member of such a firm is entitled to give the certificate required by our regulations. One member of such a firm is only half a pharmaceutical chemist.

Dr. Collins: It is for any member of the Council who thinks the young man is aggrieved to move that the certificate be accepted.

On the motion of Mr. Bennett, seconded by Sir George Owens, the report of the Certificate Committee was adopted and ordered to be entered on the minutes.

Mr. Brunker moved—

"That Mr. Middleton be informed that the certificate of practical pharmacy presented by him cannot be accepted as complying with the regulation relating to such certificate on page 55 of the Calendar of the Society for 1883, Mr. Grindley not being a pharmaceutical chemist keeping open shop in the strict sense of that regulation."

Mr. Hayes seconded the resolution, which was carried.

The Chairman moved the following resolution pursuant to notice:—

"That the subscription for the *Pharmaceutical Journal* be discontinued from and after the 30th of June next."

He had given this notice in consequence of having noticed the heavy expense the Society had incurred for the last three years in supplying the *Pharmaceutical Journal* to members of the Society. The facts had satisfied him that the experiment which had been going on since 1879 had proved an utter and costly failure. In 1879, the amount paid for the Journal was £45 2*s.* 4*d.* In 1880, it cost them £47 10*s.* 0*d.*; and in 1881, the cost was £42 9*s.* 2*d.* The cost for 1882 was still outstanding.

Mr. Allen: You have it on the paper £34 14*s.* 4*d.*

The Chairman said the fact was that they had lost a great deal of money by the matter. They had been told that it would be a great inducement to licentiates to join the Society; but so far from that having been the case the reverse had happened, as the following figures would show. In 1877 they had fifty members, and in 1878 they had seventy-nine, and there were no resignations in either of those years. In 1879 they had eighty members and there were two resignations; in 1880 there were seventy-four members and four resignations; in 1881 there were seventy-seven members and six resignations; in 1882 they had seventy-three members and eleven resignations; and in 1883 they had sixty-one members and ten had ceased to subscribe. The fact was that if they had only twenty-seven members now and were not obliged to supply the Journal they would be better off than they were under the existing arrangement.

Dr. Collins stated that the President had told him that he would not be able to be present that day, but that it was his opinion that the resolution of which the Vice-President had given notice was opposed to a resolution which the Council had passed on his motion about two months back, to the effect that when any member should become a month in arrear of his subscription to the Journal it should not be supplied to him.

Mr. Grindley: I think the motion has not been seconded yet.

Mr. Bennett seconded the motion.

The Chairman said Dr. Tichborne's resolution did not touch that which he now proposed at all.

Mr. Brunker said he was altogether with Dr. Smith in the opinion that this arrangement about the Journal was a losing game, and the sooner it was given up the better. But would it be fair towards gentlemen who had paid their subscriptions from October 1, last, on the understanding that the Journal was to be suppled to them for a year, to put an end to the arrangement in June?

The Chairman: That could be met by supplying those gentlemen with the Journal for the remainder of the year.

Mr. Grindley said the fact was being lost sight of that although financially the arrangement had not been a success, morally it had been. It had kept the members of the Society together. If they discontinued giving something for the subscriptions they would soon have no members at all except the Council, the greater part of whom did not pay anything at all towards the support of the Society. He moved that instead of hastily discontinuing the supply of the Journal, which many members considered a right, the Registrar should be instructed to send out post cards to all the members of the Society asking them whether in the event of the Journal being discontinued they would continue members of the Society.

Mr. Hayes thought that would be a very injudicious proceeding.

Mr. Brunker said the Journal was costing them a great deal, and their ability to put an end to illegal dispensing was very much interfered with by their want of funds.

Mr. Grindley: The mistake was in giving the *Pharmaceutical Journal* instead of the *Chemist and Druggist.*

Mr. Allen: Would we cease to have reports of our proceedings?

Mr. Grindley: That would follow naturally.

Mr. Brunker: No; the journals would be very glad to get them.

Mr. Wells: We should explain to the members that we want funds to carry on prosecutions. That would satisfy a great many.

Mr. Grindley: The cost of the Journal will be very much reduced in consequence of the adoption of Professor Tichborne's motion.

Mr. Brunker suggested that the Chairman should alter the date from which his resolution proposed that the subscription for the Journal should be discontinued to the 1st of October next.

The Chairman accepted the suggestion; and the resolution so altered was put and carried, Mr. Grindley dissenting.

Some financial business having been disposed of, the Council adjourned.

At the Preliminary examination, held on April 2, ten candidates presented themselves, all of whom passed.

The examination for the licence was held on April 4 and 5 (this being the first occasion on which it was held on two days under the new regulations). There were three candidates for this examination, two of whom passed. The report will be presented at next Council meeting.

Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

The eleventh general meeting of the above society was held at the Royal Institution, on Thursday, March 15. The President, Mr. Councillor Woodcock, in the chair.

The minutes of the last meeting were read and confirmed, and the following donations announced:—The *Pharmaceutical Journal*, from the Society; a specimen of *Cassia Fistula*, from Mr. J. Parkinson; 'The Sixth Annual Report of the Lancashire and Cheshire Entomological Society,' and 'Proceedings of the Liverpool Geological Society,' from the respective Societies; 'The Thirteenth Annual Report of the Free Public Library, Museum and Art Gallery,' from the Committee.

Dr. Symes showed some kola nuts which had been sent over in the moist state in earth. He mentioned their active principle, caffeine, and the use to which they were put by the natives of the districts where they are used, viz., as a stimulant under fatigue.

Mr. A. C. Abraham then showed a copy of Linnæus's first published 'Systema Naturæ,' and also the 'Pharmacopœia Augustana,' respecting some of the formulæ in which he made a few remarks.

The thanks of the meeting having been voted to Messrs. Symes and Abraham for these communications, the Chairman called upon Mr. Albert H. Samuel to read a paper upon "Indophenol." This paper will be printed in a future number.

Mr. E. Davies, in proposing a vote of thanks to the author, said that he had listened to him with considerable interest, and that by means of the diagrams the production of indophenol, although complicated, had been made clear even to those who had only an ordinary knowledge of chemistry. He had himself learned much that was new to him from the paper. He thought that there was a moral to be learned from it. He was not surprised to hear that so far the English dyers had not been successful with such a delicate preparation as this, nor were they likely to be so until the ignorant and self-conceited foremen so often employed at the head of their establishments were replaced by chemists of ability. The consequence of the present state of things would, he feared, be that we should have to send our calicoes to Germany to be printed.

The motion was seconded by Mr. M. Conroy, and carried unanimously.

The meeting closed after a few words from Mr. Samuel, in reply.

GLASGOW CHEMISTS AND DRUGGISTS' ASSOCIATION.

A meeting of this Association was held on Wednesday evening last. The chair was occupied by the President, Mr. McAdam, who, after reading some apologies for non-attendance, called on Mr. Daniel Frazer to deliver a lecture that had been announced. At the close of the lecture, Mr. Frazer, on the motion of Mr. Kinninmont, was awarded a vote of thanks. In consequence of the lateness of the hour the discussion was adjourned. The following is a report of the lecture:—

The Proposed Changes in the Pharmacy Act of 1868, and in the Educational System of the Pharmaceutical Society, together with some Remarks on the present Position of Pharmacy.

BY DANIEL FRAZER.

Through the great kindness of our esteemed President, in convening the present meeting at my special request, I am permitted to address you on the proposed changes in the Pharmacy Act of 1868. These changes have been proposed by the Council of the Pharmaceutical Society itself. They (not we provincials) have broken the ice. Our footing as traders on the unbroken ice of the legal safeguards that to a large extent give us a practical monopoly in carrying on the more legitimate part of our business has not been an over secure or comfortable one of late years. What will it be when we have to tread upon the broken ice? That the ice will be broken when we get into Parliament seems to me so manifest that I stand amazed at what I

consider the judicial blindness of the wise men of Bloomsbury Square.

In vindication of this strong language I will, with your permission, *first* discuss the proposed Pharmacy Acts Amendment Bill, as issued by the Council at their meeting in February last, along with some notice of the proposed changes in the educational system of the Pharmaceutical Society; and *second*, I will make some general remarks on the present position and future prospects of Pharmacy. I need hardly preface these remarks by saying that I by no means seek to commit a single person here to accept as his my views on the topics I now proceed to discuss.

Our esteemed friend, Mr. Kinninmont, with his usual honest impetuosity, lost no time in taking part in the discussion of the Bill that has been waged in the *Pharmaceutical Journal* since its publication there. In his letter, Mr. Kinninmont expresses satisfaction with the action of the Council for having, in his opinion, "avoided everything which had the appearance of grasping at a monopoly."

Truly, appearances are sometimes deceitful—it is not all gold that glitters. To my apprehension the weakness of the Act lies mainly in the opposite direction. It so nakedly demands additional protection for ourselves in carrying on our business that I feel sure that when it reaches Parliament this feature of it will lead to the wrecking of the Bill as a whole, and to the sweeping away of some of the protection we now enjoy. With my views on such subjects I would not object to this; but not so, I believe, with some of you.

This feature is exhibited in the preamble. Its words are:—"Whereas it is expedient for the safety of the public that sales of poisonous articles should be regulated: also, that any seller or keeper of an open shop for the retailing, dispensing, or compounding of poisons and medical prescriptions should possess a competent skilled knowledge, and also that the sale of poisons should be further regulated."

There are two quite new things embraced in this preamble—the first being the bringing within the scope of the law several articles hitherto unrestricted in their sale to the public, and the second is the demand made in it to have the sale of *non-poisonous* agents, when in the form of "medical prescriptions," confined to pharmacists and other "qualified" men. Regarding the first, I remark that as every pharmacist of any standing has hitherto labelled all the "poisonous" articles referred to in it as "poisons," little, if any, inconvenience will be caused by its enactment to us. But I would have opposed its introduction into the Bill as an unnecessary interference with trade in articles of enormous consumption, and from the sale of which no hint of any inconvenience has come from any part of the country save from the Veterinary College of Lincoln. I would also have objected to it from being persuaded that, even if it be enacted, it will prove a dead letter so far as the sale of the mineral acids by outsiders is concerned, and I think it a serious mistake to pass laws that cannot or will not be enforced.

Some years ago, along with Mr. Mackay, and other members of the Council, I strongly opposed the introduction of the first four of these "poisonous articles" into the Poison Schedule. This took place originally in 1875, when a Bill, called the "Drugging of Animals Bill," was introduced into the House of Lords. Mr. Sandford brought it under the notice of the Council, and our law agent, then present, characterized it as too absurd to have any chance of passing. The Council then was unanimous in petitioning against it. On at least three occasions since then, when white hellebore powder was included in the list, there was a considerable support given to the suggested additions to the Poison Schedules by some members, but happily the Council, by a majority, threw the suggestion overboard. But, in an evil hour, as I think it, our present Council at last yielded to the application of the men of Lincoln, and last summer it applied to the Privy Council to sanction their insertion in one of the Poison Schedules.

But, as those who interfere in other people's quarrels generally come off second best, so with our Council on that occasion. It got a direct rebuff. The Privy Council refused to add to our existing monopolies. Hence Clause 2 of the present Bill, which is so generally denounced by pharmacists who are ignorant of its history and origin, as well as by those of our number who take all the protection they can get and ask, like little Oliver, for more.

I would still more have objected to the restriction sought, for the first time in Britain, though it is embraced in the Irish Act, of confining the sale of non-poisonous agents, when in the form of "medical prescriptions," to registered pharmacists and medical licenciates. If there is one thing more than another in which pharmacists have an almost absolute practical monopoly it is the dispensing of prescriptions. So far as I know, the dispensing of prescriptions by others than pharmacists proper and medical men in their surgeries, is confined to two or three of the larger stores in London, Liverpool and Manchester. But supposing that they are dispensed in even a dozen stores scattered over the kingdom, is it worth our while risking a battle on such a subject in the House of Commons? It is in these few stores alone, so far as I know, that our practical monopoly in the dispensing of prescriptions is in any way interfered with. It cannot be doubted that the existence of this monopoly will be made plain in Parliament by the representatives of the stores. And, whatever may be said as to injuries arising to the public from the unrestricted sale of poisons or of poisonous agents, as it cannot be alleged that injury or accident has arisen from the sale of any of the non-poisonous drugs, I cannot conceive of Parliament sanctioning this addition to the monopolies already enjoyed by pharmacists.

As directly bearing upon this point, and in proof that the views I am now enunciating have not been hastily or lightly arrived at, I will here refer to a speech I delivered in the London Council on February 3, 1881, when moving the first of eleven amendments I had tabled against the Bill, then under discussion, and which, with a few exceptions, is practically the same Bill as the one now before the country (*Pharm Journ.*, [3], xi., 641).

To the views thus expressed two years ago I adhere still, if possible, with a stronger conviction as to their soundness than ever. The terms of the amendment I ventured to move against the preamble of the proposed Act, for our adoption in 1881, were these:—"Omit '*and medical prescriptions*'; or if these words are retained, insert after them the words 'containing scheduled poisons.'" To that, so long as restrictions are laid on the sale of scheduled poisons themselves, I do not object, much as I do object to the fettering of ourselves or others by any sort of legal entanglements not demanded by the laws of truth and justice.

I further ask your attention to what seems to me a remarkable change in the terms used in the preamble, and continued with a distinct emphasis throughout the Act, to describe the owner of the "open shop." In the Act of 1881 the terms were:—"Whereas, it is expedient, for the safety of the public, that all persons *selling* or keeping open shop for the retailing, dispensing or compounding of medical prescriptions, should possess a competent knowledge of their business." In the proposed Act now before us the terms are these:—"Whereas, it is expedient, for the safety of the public, that sales of poisonous articles should be regulated; also, that any *seller* or keeper of an open shop for the retailing, dispensing, or compounding of poisons and medical prescriptions, should possess a competent skilled knowledge," etc. Lawyers do not generally substitute one term for another without a distinct purpose in doing so. What I want to know is this. Is the "seller" another name for

the "keeper" of an open shop; or is it a lawyer's mode of getting at the proprietors of co-operative stores? If so, if the mere salesman in a co-operative store can thus simply be made responsible for the sale of poisons or "medical prescriptions" that he may make, then, most assuredly, the same law will be measured out to our own "unqualified" assistants. That such a result was intended by the authors of this Bill need not be insisted upon. That is not the question. If it become a part of the law of the land, its interpretation and administration will fall into other hands than those of its authors and present supporters. For my own part, though I have as yet failed to get any pharmacist to agree with me, I hold that if this clause comes into court in its present form both judge and jury will interpret it in the way I have pointed out.

So much then, for the preamble. My only apology for dwelling at such great length on it is that it is the keystone of the bridge—the arch on which the whole superstructure of the Bill rests.

The next, or "Definition Clause," as it is innocently termed, is also an all-embracing one, and demands our maturest consideration. Mr. Kinninmont sees no monopoly even in it! I see in it on the other hand, nothing but monopoly!

"Words importing the singular number only shall include the plural number." If they say one thing and mean another, why use such words at all? If you mean the plural, why not use the plural? Why, in short, not say in plain and unambiguous terms "Co-operative stores shall not be permitted to sell scheduled poisons or 'medical prescriptions' unless every single person in them be on our register?" If that is what is meant by this clause, why not say so? Do the authors of it expect this clause to pass the gauntlet of a free discussion in the House of Commons without this fact being discovered by the lynx-eyed "fourth party," if by no other? And, when discovered, when it is seen that the whole purport of it is to stab the co-operative stores and to prohibit their dealing in scheduled poisons or dispensing prescriptions, I can only express my unbounded surprise at the innocency of our Council expecting to carry it. I hold now, as I have done all along, that it is a very foolish proceeding on our part, whatever it might be for other and disinterested parties to do, to attack the stores, and that, too, in the "house of their friends." I said so over and over again long before the House of Lords decided in their favour and against our claims. With this decision in their favour in the highest Court of Appeal in the country, does any sane man expect that the House of Commons will sanction a Bill depriving the stores of their existing legal rights? No, emphatically I say, no. Do not then risk such an encounter on the floor of the House of Commons as the introduction of this clause in the Bill will certainly provoke. Our Society has already, as I have said, suffered defeat in attempting to interfere with the dispensing of poisons by the stores. Why then court another and a still more disastrous one in the very face of Parliament itself—the law-making Court of the land? Does the present most sagacious and energetic President of our Society's Council expect such a clause to be passed by men—many of whom are members of the stores themselves? Will they put their hands to the rope that is intended to hang them?

Having discussed the substance of the second clause while dealing with the preamble, I now pass on to the third clause. This is to compel wholesale drug houses to keep a record of their sales of poisons. I really do not see the need of it. Practically the thing sought is already done; and even where, in some rare cases, it may not be done, I for one would be slow to entangle our wholesale friends in the meshes of the law in the conducting of their business. It is bad enough that we are so entangled that not a few of us, I believe, would give a great deal to be free of it. Why so needlessly provoke a collision on the subject with the wholesale trade?

Then comes the fourth clause—or the first of two clauses bearing on the sale of patent medicines containing scheduled poisons. This is the labelling one. What shall I say of it; or rather, what will makers of and wholesale dealers in proprietary articles containing, in however minute and innocent a form, any of the scheduled poisons say of it? That they will oppose it cannot be doubted. Mr. Davenport, Messrs. Savory and Moore, Powell, the maker of Locock's wafers; Messrs. Edwards, Newberry, Barclay, and Maw and Sons will be up and stirring; and, as their interest in this matter is ours, we are pretty safe to leave it to them to fight our battle at this corner of the field. Only this will I ask here—how is it possible to secure that this labelling be done by makers in France, in America, or anywhere out of the United Kingdom? And if we cannot do this, how can we recover the penalties from men who are beyond our jurisdiction? For myself, I do trust that this attempt to assimilate the laws of this country to those that obtain on the Continent regarding the sales of such remedies as are here aimed at will be unsuccessful. It is bad enough when Messrs. Jones, Brown, and Robinson, in their journeys on the other side of the Channel, are put to their wits' end to obtain five drops of laudanum or a teaspoonful of paregoric when a colic or a cough requires such medicaments for their alleviation or cure. Do not, for any sake, attempt to legislate for such restrictions in this free country; or, at least, do not do it so long as our rivers and canal banks are open to would-be suicides, and so long as six-chambered revolvers and nine-inch bladed knives can be obtained without let or hindrance by the would-be assassin, or even by "Number 1" himself.

I would here ask, On whom do our Councillors seek to impose these shackles? Is it on our enemies the stores or on ourselves? On ourselves in at least the first instance. It is we pharmacists, and we almost exclusively, and not the stores who are the makers of those proprietary articles, and so it is ourselves that we are asked to burden with these legal restrictions! The Government of its own accord did impose a restriction on the sale of arsenic now many years ago, but they did it for a specific reason—the poisoning of children by its means in several districts in England; and if the Government of its own accord were now to impose such a restriction on the sale of any proprietary articles that can be proved to have been employed at all extensively for wilful poisoning, or that, through their potency, have proved to be dangerous agents in the hands of the public, I would not object. But why ourselves seek to impose these restrictions upon a whole class of remedies against which no such evidence can be adduced, and very many of which are of unquestionable value, and are largely prescribed by some of our most eminent medical men? You may like them or not like them, but you cannot put them down as long as the columns of our newspapers and the pages of our magazines, of our own Journal, and of the *Chemist and Druggist*, are open to the reception of their advertisements.

Clause 5.—This is a penalty clause. It need not trouble us much. Our wholesale friends will take good care that it does not become law, and so we can quite safely leave it in their hands.

Clause 6.—Even more certain and successful will be the opposition of the makers and of the wholesale trade to this penalty-recovering machinery.

Clause 7.—This is superfluous. The common law abundantly provides for this. Just as the great railway companies are responsible for the action of their servants, so are we for that of ours, and rightly are so.

This responsibility, both at civil and criminal law, on the part of pharmacists, not only for their own actings, but for the actings of every one of their assistants and apprentices, is, I have all along held, the greatest safeguard that the public can have for the careful conducting of our most onerous business. Self-interest comes in here with immediate and immense force. If I, by any

chance, take down this bottle instead of that one, and substitute a poisonous for a simple remedy, and fatal results follow, I am responsible at criminal law, and liable to be tried for culpable homicide or manslaughter; or if I escape this, as happened in well-known cases in England and in Ireland some yeare ago, and I be only made responsible at civil law, I may have, as in one of these cases, to pay £2000 of damages, in addition to immensely injuring, if not ruining, my business. With such possibilities attached to the proper conducting of our business, even apart from all the feelings of grief and mortification engendered by our being the means of death or of serious injury to another, can more stringent securities for the proper administration of our business be reasonably demanded of us? I think not; and certainly we ourselves should not, however much we may be annoyed at the stores, be instrumental in imposing still furthur penalties on the conducting of it.

Happily we have at last reached a clause to which I can give my most cordial support. I mean the one requiring the placing of a "qualified" assistant in every branch shop. But I wonder how many of the London Council agree with me in this. They have all accepted it, but how many of them love it? This I have no means of knowing; but this I know, that when I in committee two years ago proposed, as I think I did—but at least I supported—the insertion of such a clause as the present in the Bill then before us, it was most strenuously and successfully opposed by the great majority of the then existing Council—one not largely differing from the present one.

I wanted such a clause then, and I welcome this one now, because I maintain that as long as the Act of 1868 exists in its integrity I have no right to open a second or third shop, in addition to the one qualified by my own attendance, unless I put a qualified assistant in it.

Clause 9.—Though I have already referred to the substance of this clause, I wish here to draw your special attention to the exact wording of it—"Duly qualified persons to sell medical prescriptions and sell poisons." Hitherto the words "medical prescriptions" were modestly placed in the rear of "poisons." Now they are boldly put in the front, and "poisons" are made to play second fiddle to the prescriptions. There is also here a decided step taken in advance in the use made of the terms "seller" and "keeper." In the preamble it is "any seller *or* keeper of an open shop." Now it is boldly stated "unless the seller *and* keeper of any such open shop." If the seller and keeper are one, why "seller *and* keeper?" I would strongly urge, whatever may be your views as to the general purport of the Bill, that you get a clear and explicit explanation of all that is involved in the use of these words—"the seller *and* the keeper" of an open shop. Ask any lawyer how he would interpret the words, were he employed to defend you, in regard to their true meaning in a court of law.

Clause 10 is apparently aimed at the co-operative stores, or at medical men who carry on business in other names than their own. The penalty asked is a pretty heavy one, but as it does not affect aboveboard traders who do not object to their names being given, even where the firm under which they trade may not contain it, we need not greatly concern ourselves with it.

Clause 11.—A clause of penalties that need not in any way disturb us, law-abiding subjects of Her Majesty.

Not so with clause 12.

It is remarkable above all the other clauses of the Bill from the quiet way in which it seeks arbitrary powers for our Society that, if obtained in the terms of it, will, in my opinion, whatever the Council itself may have intended by it, completely override even the powers of the Privy Council itself. To the corresponding clause of the Bill of 1881 I moved that after "Britain" the words "with consent of the Privy Council" be inserted, but I was overruled by the authority of our legal adviser—he stating that that was necessarily implied. Well, if it is implied, why is it not so stated here, as it is stated in a much less important and less far-reaching clause—namely, the second, or "Poisonous Articles" clause? There the authority of the Privy Council is recognized; here it is completely ignored.

Further, I would oppose it even were this saving clause in it, on the ground of the demand it makes for powers to revolutionize the examinations and powers to alter the fees, and that means, judging by all antecedent legislation on the subject, to increase them. If it be carried, the Council shall practically, as representing the Society, have full power to institute a curriculum through which all our candidates must pass, and this, probably, without the Society, in its corporate capacity, being consulted in the matter. In the face of the large numbers of our best men who are leaving our ranks in consequence of even the existing standard of examinations in use, and their expense, and in face of the transference of large portions of our business to other traders—including the stores—are you willing to give your Council such enormous powers? Unless you are so prepared you had better take care that, whatever other part of the Bill be carried, this clause shall not. What makes me the more anxious upon this point is—(1st) that in the opinion of two members of the existing Council, as we shall see further on, the Council has already in its actings infringed the existing law; and (2nd) because of finding, in a letter to the Council to which I shall also refer later on, this sentence:—

"But little alteration of the Pharmacy Act of 1868 is needed to effect all that is above indicated in the way of Parliamentary legislation; *the rest* can be accomplished by bye-laws and by the *resolutions of the Council.* (*Note.*—By the Council: not by the Privy Council—not by the Society!)"

And all this, too, in face of the closing sentence of clause 2 of the Act of 1852:—

"Provided always, that all such original bye-laws and all altered, amended, or additional bye-laws, shall be confirmed and approved by a special general meeting of the members of the said Pharmaceutical Society and by one of Her Majesty's principal Secretaries of State."

Before parting with this part of my subject, I frankly repeat the opinion I have never ceased to hold—that I believe the examinations are already, in their stringency, and in their expense, beyond the requirements of the case. As an evidence of this you have but to read the results of the February examinations:—

11 Majors examined	6 failed!
84 Minors examined	56 failed! !*

Clause 13.—£5 of a penalty if I admit an apprentice into my premises before he has passed the Preliminary! I do not know what it may be in England, where large premiums are often given by the apprentices, but in Scotland, where we pay ours salaries ranging from £10 to £25 a year, such apprentices cannot, judging by my own experience, be obtained. Though I have some six at present in my different shops, only one of them had passed his Preliminary before entering. If it be replied, the penalty is only to apply to articled apprentices, then I reply it does not affect me, for I have ceased articling apprentices for many years. The demand for apprentices who have passed the Preliminary is as likely to be obeyed, in Scotland at least, as was the old demand of calling spirits from the mighty deep. The reason is quite simple. The families who alone, or who almost exclu-

* "Indeed, looking at the results of the examinations, I do not consider any material change at present desirable. The Minor examination, which confers all the privileges of the Pharmacy Act, as now conducted, affords a sufficient guarantee of competence to keep an open shop for retailing, dispensing and compounding medicines. It is thoroughly practical, and any increased stringency could only have the effect of adding to the already large number of candidates who are rejected."—*From Dr. Greenhow's Report on Examinations*, March 8, 1881.

sively supply us with our apprentices do not and cannot educate their children up to the point needed for passing the examinations until the candidates themselves earn the means of obtaining the needed education by their labours. Such, at all events in Glasgow, is my experience over the last forty or more years. I need not add that I oppose this clause, as I have done most of its predecessors.

Clauses 14 and 15 can pass without remark.

Clause 16 I do not object to. But why make two bites of a cherry—why not make a good bolt when swallowing so much? Why not at once abolish the Major examination and declare all the present and future Minors to be Majors? Some say this would be an injustice to the existing Majors. Well, call them Majors No. 1, or "Fellows," if they like. It will cost no money and break no bones, and if it please them it will do us no harm.

Clause 17.—I think this quite right, having on several occasions seen the beneficial working of the principle it contains. It will not keep out any proper candidate, and it may be useful in keeping out an improper one. During my ten years of experience I only recollect of two cases in which it was put to active use, and in both cases I quite agreed with the action of my colleagues in the Council.

Clause 18.—This dog is so nearly dead that I hardly think it worth while spending a clause on him—giving him the last knock on the head.

Clause 19.—No objection to it.

Clause 20.—I suppose we must have a little red tape now and then, and as there does not seem a formidable use of it here, I do not object to it.

Clause 21.—Most certainly. Punish to your heart's content everybody guilty of falsehood. No punishment can well be too severe for wilful misrepresentations.

Clause 22.—That is, that this Act is not to apply to Ireland. Most certainly not. It is, however, quite worth while, to show the hopeful progress our Society is making in some points, if it is losing in others, to recall how matters stood in 1875, when the Irish Act was before Parliament. After one of the keenest discussions at which I ever was present, the Council, in June of that year, petitioned the House of Commons against the Bill, and petitioned for one to embrace the whole kingdom. Mr. Sandford, Mr. Schacht and myself, were the only opponents in a meeting of eighteen members, and so the petition against it was sent to the House of Commons. In the Journal (that of June 5, 1875) reporting this discussion there is a list of one hundred and sixteen petitions sent in to Parliament against the Act—Edinburgh, Aberdeen, Dundee, Perth, Greenock, Dumfries, Montrose, Peterhead and Elgin, being the Scotch towns. Glasgow, happily, is not on the list.

Clause 23.—Commencement of the Act. Instead of fixing on a specific date, better say—"The Act shall come into operation in two years, or thereby, from the date of its receiving the signature of Her Majesty." This would give all a reasonable time to prepare for its operation.

The Schedule of Poisonous Articles.—On the merits of the proposed addition to Scheduled Articles, the only article in it that I think there is any colour for inserting here is the last one—carbolic acid. It certainly has been the cause of numerous poisonings by misadventure, and so I think there is a call for some restriction being put on its sale—much as I object to all unnecessary legislation of a restrictive character.

Having now gone over the Bill as issued by our London Council, and having frankly stated my views on what it contains, I will now, with your permission, refer to some three things it does *not* contain, but which formed parts of the Bill in 1881. Regarding the first of these, namely, Clause 5 of that Act, as published in the Journal of June 8, of that year, I remark:—This clause was intended to prevent the widows of deceased pharmacists carrying on their husbands' business by means of a qualified assistant for a longer period than three years, except with the permission of the London Council. This clause formed the subject of much earnest debate in the Council. Mr. Sandford pled with great eloquence against the insertion of this prohibitory clause. With his permission I was allowed to move its rejection; while Mr. Sandford seconded and supported the rejection with all his known ability and earnestness. Nothwithstanding this, and the fact that Messrs. Mackay, Williams, Bottle, and others took the same view of the question, we could only command six out of nineteen votes, and consequently it stood a part of the Bill sanctioned by the Council at that time.

Now, it is not once referred to in the Bill of to-day, nor in the published discussion that took place when it was carried in the Council. The Council of to-day differs but little from that of two years ago—Messrs. Young and Borland have taken the place of Mr. Mackay and myself; Messrs. Carteighe and Walter Hills the place of Messrs. Sandford and Hills; all the others are the same. Whence, then, this change of view, or, at least, of action? Is it due to influence from without or from within? This I have no means of knowing; but this I do know, and you all may know, that at a meeting of the Executive of the Chemists and Druggists' Trade Association, held in Birmingham, on the 19th of February last, Mr. Barclay, of Birmingham, moved for its insertion in the Bill of this year. Mr. Barclay's motion was carried and remitted to "officers" of the Association and a small Committee to take such steps as they may deem desirable to carry out the wishes of the Executive in amending the Pharmacy Acts Amendment Bill of 1883. One of these officers, Mr. Hampson, occupied his place as President, and there were also present Messrs. Andrews and Churchill. There is no record in the published reports of the London Council's proceedings of any of these gentlemen standing up in it for the insertion of this clause, as they all did two years ago. Neither, on the other hand, is there any record in the report of the Trade Association meeting of their opposing Mr. Barclay's motion. I have the highest respect for the personal qualities of all these three gentlemen, and I by no means intend to hint that they took one side of the question in Bloomsbury Square and another in Birmingham. Over and over again did I find myself in the position of appearing to support, or at least of not actively opposing motions in the Council against which I had protested in Committee, but being in a hopeless minority, did not renew a profitless opposition in the Council. That, I am convinced, was the case with Messrs. Hampson, Churchill and Andrews, in one or other of the meetings. I am, however, curious to know which view had the benefit of their personal support. Do they still hold the views on the subject they held in 1881, or have they come to accept the views then so eloquently pled by Mr. Sandford and Mr. Mackay? I sincerely hope they have. I also would like to know if Mr. Schacht still holds the opinion he held then, when he moved that the widow should only have *one* year to wind-up her husband's business? Have such men as Messrs. Greenish, Woolley and Symes altered the views they then held and come to accept those of Mr. Sandford that they so strongly opposed. It would indeed be quite a feather in my cap to find a band of such men as these accepting the views on this subject I so unsuccessfully advocated in their presence so long ago. I cannot too strongly express the surprise I felt at Mr. Hampson's view on this special question, knowing well his leanings to "Women's Rights" in other fields.* On the merits of the question, I maintain that to deprive, through legislative interference, the widow of the means of carrying on her husband's business for her own behoof and that of her children, when she has them, is a piece

* It is, however, only fair to add that the grounds of the opposition to widows carrying on their husbands' business was their want of that *personal* qualification that these gentlemen hold the Act of 1868 implied, and the safety of the public demanded.

of intolerable tyranny, and which, happily, no Parliament in these days, even when backed up by all the influence which Mr. Barclay undoubtedly possesses, can for a moment be supposed capable of granting.

There were two other clauses of the Bill before the Council in 1881 which have disappeared from that of this year, namely, the first and the last enacting one. Thanks to Mr. Mackay and the opposition all over Scotland, the first—that to allow of others than residents in Scotland being appointed to the Examination Board in Edinburgh—was lost by eleven to six, being the only one out of my eleven amendments that was carried.

The last clause to which I have to refer as having been in the Bill of 1881, but which has not been repeated in that of this year, is the one that proposed to exempt Minors from serving as jurymen. The Trade Association have, however, resolved to demand its insertion. So, I think, has the Scotch Council, and if so, in face of my protesting against their doing so. I have always opposed this proposed exemption, and for two reasons:—First. I feel convinced that the application to Parliament will not only be unsuccessful, but will almost certainly lead to the deprivation of the pharmaceutical chemists themselves of the right of exemption which they now enjoy. Second. I oppose it on the merits as well. Though not professional men, we are generally very fairly educated, and enjoy a social position superior to many other classes of traders. The Government will not readily deprive themselves of some twelve thousand men so qualified for the office of jurymen as are the chemists and druggists of the nation. The wise course in the matter, I believe will be "to let sleeping dogs lie."

(*To be continued.*)

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

A meeting of this Society was held on Thursday, April 5, Dr. W. H. Perkin, F.R.S., President, in the chair.

It was announced that a ballot for the election of Fellows would take place at the next meeting of the Society (April 19).

The following certificates were read for the first time:—H. R. Mill, J. E. Richardson, A. H. Samuel, R. Williams.

Mr. L. T. Wright then read a paper—

On the Estimation of Hydrogen Sulphide and Carbonic Anhydride in Coal-gas.—In the analysis of crude coal-gas by absorbtiometric methods, as in Bunsen's, etc., it is usual to term that portion of the gas which is absorbed by manganic peroxide, ferric oxide, etc., hydrogen sulphide, whilst that portion which is absorbed by caustic potash and not by manganic peroxide is usually designated carbonic anhydride. The author first gives some results obtained by absorption with a bullet of manganese peroxide, and with KHO solution in a Frankland and Ward apparatus; higher results were always obtained when the gases were absorbed successively, than when they were absorbed simultaneously by using a solution of KHO. This difference between the results was considerably diminished by submitting the manganese bullet to a current of clean coal-gas, before using it for absorption. The author prefers the following method:—The crude coal-gas dried and freed from ammonia by passing through phosphoric acid, is passed through two weighed U tubes; the first charged with roughly powdered cupric phosphate in one leg and calcium chloride in the other, the second containing soda lime (slightly moistened by exposure to the air for about eighteen hours) and calcium chloride. The increase of weight in the first gives the sulphuretted hydrogen, in the second the carbonic anhydride. The copper phosphate is prepared thus:—2 lbs. of ordinary phosphate of soda are dissolved in 1 gallon of water and $2\frac{1}{2}$ lbs. of cupric sulphate in $1\frac{1}{2}$ gallons of water, The two solutions are vigorously stirred together, the precipitate washed by decantation and dried at 100° C. Phosphate thus prepared absorbs hydrogen sulphide very perfectly. Before using the absorption tubes, 3 cubic feet of clean dry coal-gas are passed through to "saturate" the reagents. The gas during the absorption should be passed at the rate of $\frac{1}{4}$ to $\frac{1}{2}$ cubic foot per hour. The total quantity must vary with the impurity in the gas. The sum of the hydrogen sulphide and carbonic anhydride thus estimated is always greater than the number obtained by absorbing these gases simultaneously in one U tube charged with soda lime. A 6 inch U tube charged with cupric phosphate will absorb 20 grains of hydrogen sulphide. A similar sized U tube charged with soda lime will absorb perfectly 18 grains of carbonic anhydride.

Dr. Armstrong suggested that some acetylen might be absorbed by the cupric phosphate.

The President asked if bisulphide of carbon vapour was absorbed by soda lime.

Mr. Wright said that he did not think that the gain of weight was due to absorption of acetylen, and in answer to the President said that bisulphide of carbon was not absorbed by ordinary soda lime from gas previously freed from hydrogen sulphide.

The Secretary then read a paper entitled—

Contribution to the Chemistry of the Cerite Metals. By B. Brauner.—In the first part of the paper the author gives an account of a most careful determination of the atomic weight of didymium. The numbers obtained by chemists differ widely from each other, from 142·7 to 147·39. The author finds that the so-called pure didymium can be split up into heterogeneous constituents. By an elaborate process of purification a sulphate was obtained which was proved by fractional precipitation with ammonia and with sulphate of potassium to be homogeneous. From this precipitation the atomic weight of didymium was found to be 145·4. In a previous paper the author obtained the number 146·58, while Cleve gave the atomic weight as 147·2; such discrepancies seemed to indicate the presence of some metal of higher atomic weight and of a less basic nature. This metal the author eventually succeeded in isolating; its formiate is difficultly soluble, and by its absorption spectrum it was identified with samarium. The author has calculated its atomic weight to be 150. The effect of the presence of samarium on the absorption spectrum of didymium is carefully studied. The paper concludes with an investigation as to whether cerite contains earths of the yttria group as well as those of the cerium group. By taking advantage of the solubility of the formiates of the yttria group, the author separated out a fraction with atomic weight 114·5, whose spark spectrum showed the presence of yttria, whilst holmia, thullia and erbia were recognized by their absorption bands, and the presence of terbia also was determined.

A communication entitled—

Some Compounds of Antimony and Bismuth containing two Halogens, by R. W. Atkinson, was then read by the Secretary.—Amongst the so-called double salts, one of the best characterized is that produced from antimonious chloride and potassium chloride. The author has prepared the compounds obtained by combining antimonious chloride with potassium bromide and antimonious bromide with potassium chloride. On the theory of a molecular combination the first compound should be $SbCl_3 + 3KBr$, the second $SbBr_3 + 3KCl$. In both cases the author finds that the compound $Sb_2Cl_6Br_6K_6 + 3H_2O$ is formed. The identity of the two compounds was proved by identity in colour, crystalline form, formula and chemical behaviour. The action of heat upon the crystals is of considerable interest; at 100° the lemon-yellow substance darkens, and between 200° and 300° white antimonious fumes escape, leaving a white mass behind which contains chlorine and bromine in equal

atomic proportions. Attempts to prepare a similar bismuth compound were unsuccessful, but a yellow crystalline salt, $Bi_2Cl_6Br_4K_4 + 3H_2O$, was obtained.

Professor McLeod said that it would be of great interest to ascertain the composition of the antimonious fumes given off when the substance was heated.

The Society then adjourned until April 19.

CHEMISTS' ASSISTANTS' ASSOCIATION.

At a meeting of this Association, held on Tuesday the 3rd inst., the following paper, on "Pharmaceutical Politics," was read by Mr. R. W. Giles.

The discussion upon the paper was postponed until Wednesday evening next.

Pharmaceutical Politics.

BY R. W. GILES.

"The word politics," said Mr. Pickwick, "comprises in itself a difficult study of no inconsiderable magnitude."

This oracular and incontrovertible proposition reproves the temerity which would presume to condense the whole subject of pharmaceutical politics into a single evening's address; especially as time must be allowed for others to express their opinions. For politics without discussion would be about as insipid as cold veal without bacon.

I am, however, unexpectedly assisted in contracting my observations by the appearance of the new Pharmacy Bill, which has flashed meteor-like across the horizon since you did me the honour to invite me to address you, when you at the same time suggested the subject for our evening's meditations.

This happy accident droppeth upon me in the quality of mercy and like the gentle rain that is twice blessed. It justifies me in concentrating attention upon the legislative aspect of pharmaceutical politics, and cannot fail to give an interest to our proceedings which I could not hope to arouse under less stimulating circumstances.

In order to open the discussion logically I must refer at some length to the history of pharmacy; though in so doing I cannot help repeating a twice-told tale, and must run the risk of wearying you by going over again a series of events with which you are all more or less familiar. It would, however, be a mere waste of time to dwell upon the condition of pharmacy previous to the formation of the Pharmaceutical Society. Pharmacy can scarcely be said to have existed in this country before that epoch. It was in a state of chaos, without organization and without order. Not but what there were, even then, some pharmacies in which business was conducted creditably and even scientifically; but these were rare exceptions to a prevailing average of incompetence.

Let me give you an illustration from a London house of considerable repute, where my father was an assistant in the early part of the present century. The proprietor was an apothecary in large practice, at the sign of the Galen's Head, in the city. There was a good laboratory, in which pharmaceutical preparations were manufactured upon a large scale. Everything was genuine and of best quality. There was a staff of assistants, qualified as times went, directed by an old apothecary who had charge of the retail shop and dispensing department. One day, shortly after the publication of the Pharmacopœia of 1809, a high functionary of the College of Physicians came in and interrogated this ancient worthy upon the preparations of mercury, which had been newly named in the recent publication. The old gentleman was at fault, and being requested to furnish 2 grains of "hydrargyri submurias," he proceeded to weigh out 2 grains of corrosive sublimate, which had been previously known as "hydrargyrus muriatus." The doctor (very probably with a pedantic assumption of superior knowledge, which is always exasperating) pointed out the serious mistake the dispenser was making, whereupon the old man's temper boiled over and he burst out with, "Confound your new-fangled names, your submuriates and your oxymuriates, your carbonates and your subcarbonates. I wish the whole College of Physicians was in H—,"—well let us say Hades, though it is a feeble substitute for the original Saxon.

If this was the state of pharmaceutical science amongst the responsible managers of London houses of first rank, it may be imagined what was the condition of obscure shops in the provinces. Happily for the lives of King George's lieges, the medical practice of that day was more simple than it has since become; the materia medica, with which the pharmacist had to deal, comprehended no deadly alkaloids and few ambiguous salts; nor was he often called upon to supply potential remedies in concentrated forms, whereby the patient gets the maximum of doses and the dispenser the minimum of remuneration; the relations of pay and responsibility being ingeniously adjusted according to the rule of three inverse. Provided he could manipulate some innocent decoctions and infusions (they used to be made "fresh" in those unsophisticated days), and could compound a saline mixture or an almond emulsion, *secundum artem*, he was esteemed capable of performing the whole duty of man in that station of life.

It is told of a French *avocat* that he thought fit to trace the sequence of events which led up to his client's wrong from the creation of the world, and that he pursued this part of his narrative with so much prolixity that the Court, losing patience, presently interrupted him with the gentle monition—"*Eh bien! passons au deluge!*"

I am much indebted, sir, to your greater forbearance that you have not yet interrupted my antediluvian reminiscences, and I will now pass on, as rapidly as I may, to that deluge which swept away the old world of pharmacy and is gradually replacing it with the better order of things inaugurated by the Pharmaceutical Society.

But in spite of my desire to escape reproof it will first be necessary to refer to those events which remotely called the Society into existence; for it is almost an axiom that no bodies (much less one so disunited as were the chemists and druggists of that period) ever reform themselves without external pressure.

The early history of pharmacy presents a view of the chemists and druggists in a chronic (if intermittent) state of persecution at the hands of the medical profession, especially of the Society of Apothecaries, who, having unmistakably "interloped" upon the practice of medicine and surgery, and to a great extent neglected their own legitimate functions, naturally looked with the greater suspicion upon the chemists and druggists, who in their turn had shown a disposition to take up the business which the apothecaries had only half thrown up; for they were still willing to retain its privileges and emoluments.

It is only necessary to remind you of the derivation of the word "apothecary," from ἀποθήκη, a store, to show that the apothecary was originally the storekeeper for drugs, or in other words, a pharmacist. The pharmacists of to-day are therefore the veritable successors of the apothecaries of former times, who then claimed the exclusive right to the name "pharmaceutical," which they have since as completely abandoned. Thus we find that in one of the many assaults made upon the chemists and druggists by the apothecaries, viz., in the year 1794, an attempt was made to put them down by a system of what we should now call "Boycotting," for which amiable purpose an association was formed "under the title of the General *Pharmaceutical* Association of Great Britain," consisting entirely of apothecaries; and curiously enough it established itself in Bloomsbury Square. The chief object of this notable combination, as stated in its articles, was that the members "should engage to deal with such druggists only as would immediately consent to relinquish the composition of all medi-

cal prescriptions—to retain to themselves their wholesale occupation alone—and to receive no apprentice and employ no assistant who had not had a classical education." It is a pity that the composers of this liberal manifesto had not had the advantage of an *English* education, that they might have made it more clear that it was the qualified apothecary, and not the unqualified druggist, who was to insist upon the classical education of his assistants and apprentices. We cannot suppose that at this early period the apothecaries were agitated by a desire to establish a "Preliminary examination" for chemists and druggists concurrently with a determination to keep them down to the level of traders.

It is sufficiently clear, from the above quotation, that at this time the business of the apothecary and that of the chemist and druggist bore the same relations to each other in this country as still exist in many Continental states between the profession of pharmacy and the trade of the Drogueries or Droghcrrias; and I am much mistaken if that distribution of business is not tending to re-establish itself. I think pharmacy will again sever itself from drysaltery, which will either be carried on in a new order of shops, or, more probably, will be divided between the grocers and the oilmen, who are quite competent to perform it. "Men do not cut blocks with razors," by which I mean that you do not want a scientifically trained man to sell common drugs and chemicals required for rough domestic or technical uses. There is, to my thinking, an incompatibility between the two functions which have hitherto been united in the person of the chemist and druggist, in consequence of which both have suffered. I feel sure that a separation will prove advantageous to pharmacy, and that it will (by affording more suitable conditions) give an impetus to pharmaceutical research which the old system tended to stifle. I also believe that this new development will be hastened by the operation of the proposed Pharmacy Bill, if it should become law, as I sincerely trust it may.

So long as the attacks upon the chemists and druggists were confined to the medical profession, the former were always able to resist legislative interference with their trade. Parliament seems to have penetrated the motives by which these attacks were instigated, and would not lend itself to the efforts of the apothecaries to secure for themselves a monopoly which would have operated as a tax upon the public without equivalent advantage. From this we may learn (and it is of the utmost importance that we should learn, from whatever source the teaching may come) that it would be absolutely useless to apply to Parliament for anything savouring of monopoly in these later days of more enlightened political economy.

All the Bills affecting chemists and druggists which had been submitted to Parliament previous to 1815 were prompted by this spirit, and had one common character—they proposed to place the druggists at the mercy of a medical control, in which they themselves would have no voice. It was usually provided that the druggists should be examined by a Medical Board of Examiners, from whom they must obtain licences before they would be permitted to go into business; but no provisions were made for pharmaceutical education. It was the old story of making bricks without straw,—the cause of the first workman's strike upon record and the type of a good many that have happened since, in which obstinate journeymen have set their faces against economic improvements The druggists were as obstinate as their neighbours, and had better reason. In fact, the incorporated medical bodies (and the Society of Apothecaries most of all) wanted to "domineer" over the unincorporated chemists and druggists; but they attempted this selfishly, without showing a corresponding desire to accomplish a public benefit, and consequently all their attempts fell through.

The Apothecaries Act, 1815, was the last of the measures of this epoch. It deserves some notice here because it is the Act upon which apothecaries, and other medical practitioners also, have relied as prohibiting what is known as "counter prescribing." It was a stringent measure, in the form in which it was presented to Parliament, and aroused the strenuous opposition of the druggists, who succeeded in obtaining the withdrawal of all the obnoxious clauses aimed at themselves, and secured the insertion of a clause which expressly exempted their trade from its operation. That clause is as follows, viz:—

"Provided always, and be it further enacted, that nothing in this Act contained shall extend, or be construed to extend, to prejudice or in any way affect the trade and business of a chemist and druggist; but all persons using or exercising the said trade, or who shall or may hereafter exercise the same, shall and may use, exercise, and carry on the same trade in such manner and as fully and amply to all intents and purposes as they might have done in case this Act had not been made."

It is difficult to believe that even a lawyer would attempt to put an Act thus limited in force against the trade of a chemist and druggist. It has been attempted nevertheless, though the attempt failed, and the capacity of the English language to express what it intended was upheld. But so marvellous is the possibility of legal ambiguity that an eminent judge lately deceased has said that if a competent lawyer were to contend before him that black was white, he should feel it necessary to suspend his judgment until he had listened to the argument.

"Counter prescribing" is a delicate and difficult question of pharmaceutical politics, and I could not therefore omit to refer to it; but do not suppose that I am an advocate for the abuse of the practice. It is a practice which every good pharmacist desires to keep within reasonable bounds—only to be defined by public convenience. None but idiots (of whom I have met many) desire or expect to suppress it altogether. I go just so far as, and no farther than, the Committee of the General Medical Council appointed in 1865 to inquire into and report upon the two Pharmacy Bills which were before Parliament in that year. Their report contains the following passage, viz.:—

"It is well known that many existing chemists and druggists, both members of the Pharmaceutical Society and others, practise medicine, although unqualified by law and not competent by education. To a limited extent this practice may be inevitable, and at all events cannot be prevented. But the existence of it gives peculiar facilities and temptations to the pharmaceutic chemist to embark largely in irregular medical practice as an unqualified practitioner."

It is thus officially admitted on the authority of the Medical Council, that counter prescribing "to a limited extent is inevitable and cannot be prevented." I may say that the person least able to prevent it is the "pharmaceutic chemist," who has to choose between obliging and offending his customer, and who would generally find his own pecuniary interests better served by referring his "inevitable" patient to the nearest doctor, if he dared to do so. The only practical question is, therefore, how can the "inevitable" be kept within such reasonable limits as not to interfere with the public convenience on the one hand and not to imperil the public safety on the other. I utterly refuse to recognize the interests of the medical profession in the matter. Neither they nor pharmacists have a vested interest in the diseases and sufferings of their fellow-creatures, who have the most unimpeachable right to cure themselves by any means accessible to them. Let there be no nonsense about that. I say confidently that improved pharmaceutical education is the only agency by which "counter prescribing" can be kept within legitimate bounds. Education teaches us to know certain things. That is its first aim, but it is not its sole effect; it also generates a logical mind, which enables us to distinguish between that which we know and that which we do *not* know. A mind thus

trained will fight very shy of meddling with obscure symptoms which it *knows* that it has not the power to interpret. It will make a prudent application of the proverb "Omne ignotum pro mirabili," and will not make speculative shots at disease in the dark. On the other hand the illogical man, who sees no danger, because his eyes are shut though he knows it not, concludes there is none, like the much libelled ostrich, and proceeds with the confidence of ignorance to treat the premonitory symptoms of paralysis as a bilious headache. For still—

"Fools rush in where angels fear to tread."

Pharmaceutical education operates in yet another way. By the dignity it gives to his calling and the pride it inspires in the pursuit of that calling, it offers a worthy goal for the pharmacist's ambition, and creates a perfect horror of empiricism. Is it not well known that high pharmacy and counter prescribing are the opposite poles of the pharmaceutical microcosm?

It was not in the nature of things that the anomalous condition of pharmacy, at the period of which I am speaking, should be regarded with approval in other quarters, outside the medical profession. Its Bashi-Bazouk irregularity was too flagrant to escape the notice and censure of less interested reformers, although no overt proceedings were taken until the year 1839. It should, however, be recorded to the honour of the late Mr. John Savory, that he endeavoured to induce the chemists and druggists of London to co-operate with him in promoting a Pharmacy Bill in the interests of the trade in the year 1830. But it was too early then to enlist hearty support or to rouse a real belief in the practicability of such a novel proposition. The druggists were not yet prepared to assert that they too were men and brothers, or to look for anything better than to be left to live and die in peace. Mr. Savory met with so much apathy and incredulity that he found it hopeless to persevere, and he reluctantly abandoned his enterprise, which, however, deserves to be held in honour, not the less because it failed, as every first attempt in similarly new ground is likely to do. It was the first enunciation of the principle that chemists and druggists were entitled to be legislated for, instead of to be legislated against; and it cannot be doubted that it was one of those useful failures that lay the foundation for future success.

The Medical Reform Movement, which began in 1839 in a parliamentary inquiry, came to no immediate result, but it continued to simmer until it took shape, in 1841, in the obnoxious Medical Bill, brought in by Mr. Hawes, which literally bristled with penalties and bid fair, should it become law, to improve the chemists and druggists off the face of the earth. I can well remember the announcement of this measure and the consternation which it spread amongst the trade throughout the country. It would have compelled the druggists to obtain a licence to carry on their business from a body practically constituted by the votes of the medical profession, amongst whom their old enemies, the apothecaries, would have been dominant by reason of their numerical majority. The Bill, in fact, attempted too much and was too arbitrary. It has been wisely said that "strength is strong, but weakness is stronger," and this attempt to crush the weak proved the wisdom of the saying. Vigorous action was taken by the chemists and druggists in London, to whom the provinces have often been more indebted than they are always ready to acknowledge. A committee was formed to watch and to oppose the progress of the Bill in Parliament, consisting of the following members, whose honoured names I ask your permission to read, viz.:—William Allen, F.R.S., Robert Alsop, Jacob Bell, Richard Battley, John T. Barry, Charles Barron, Thomas Butler, Edwin Briggs, George Baxter, Charles Dinneford, Charles Davy, Samuel De Castro, John Ellis, Robert Farmer, Samuel Foulger, Joseph Gifford, Samuel Green, Thrower Herring, Thomas Herring, Edward Horner, W. B. Hudson, William Ince, Thomas Keating, William Lowe, J. S. Lescher, T. N. R. Morson, Samuel M. Mayhew, Richard Hotham Pigeon, Matthew Pound, John Savory, Peter Squire, George W. Smith, Joseph Smith, Edwin Simkin, Ralph Stamper, John Toller, George Waugh, Edward Winstanley, Thomas Walker.

This was not the first occasion by many that the disintegral atoms of which the drug interest was made up had been brought together to make common cause against hostile attacks; but this particular occasion was characterized by special features producing important consequences, without which it is probable that we should not be here to-night discussing pharmaceutical politics, for there might, in all probability, have been no such thing as pharmaceutical politics to discuss. The speciality of this defensive combination will be best told in the words of the resolutions passed by the Committee and adopted by a general meeting of the trade held on April 15, 1841, viz.:—

"That a Society be forthwith formed under the title of 'The Pharmaceutical Society of Great Britain.'

"That the object of the Society be to benefit the public, and elevate the profession of pharmacy, by furnishing the means of proper instruction; to protect the collective and individual interests and privileges of all its members in the event of any hostile attack in Parliament or otherwise; to establish a club for the relief of decayed or distressed members."

The Report of the Committee presented upon this occasion concluded with the following memorable declaration of independence, which must have appeared little less than revolutionary to the mass of those to whom it was addressed, and evidently required no small exercise of courage on the part of those who made it, to wit:—

"Your Committee, having considered the subject, are of opinion that the chemists and druggists are capable of self-government."

I like that interpolation, "having considered the subject." What a picture it presents of the hesitation and mistrust to be overcome before the Committee could screw their courage to the sticking point and venture to call their souls their own!

At this meeting, viz.: on the 15th of April, 1841, the Pharmaceutical Society was formally constituted by the enrolment of a hundred members on the spot. Let the 15th of April be for ever marked with a white stone in the calendar of all good pharmacists.

I shall ask you to pause at this first epoch of inauguration and to consider how sagaciously comprehensive was the programme of the young Society, including the three great purposes of Education, Protection, and Benevolence, to be from thenceforth the Faith, Hope and Charity of the pharmaceutical creed; but the greatest of these is Education. It was this which gave vitality to an ephemeral association called suddenly into being by fear and self-interest, to be as quickly dissolved when the immediate crisis was past if it had not consecrated itself to public usefulness by a wise, elevated, and far-seeing policy. I shall also ask you to observe how steadfastly the Society, as it grew in years and in organization, has held to the principles thus early propounded; amplifying, perfecting and extending, but adding nothing thereto and diminishing nothing therefrom. I shall ask you to give your loyal support to the institution which has done so much on these broad lines and has deserved so well,—to resist the temptation to small criticism (the weakness of little minds), and to the still more detestable spirit of schism (which is as the sin of witchcraft), to do that which in you lies to strengthen and still further to extend its influence and the scope of its operations, and this not solely upon sentimental grounds, in grateful remembrance of how much its disinterested founders have done for you and for the vocation which I hope you love, and of whose coming estimation in the eyes of men I trust you will have reason to be proud,—how much greater reason if you yourselves contribute, as I doubt

not you will, to that estimation—I say not solely upon these grounds, though I should do injustice to your generous sympathies if I doubted your willing acknowledgment of these strong claims, but also upon practical, I might almost say upon selfish, grounds, namely, that the Society is the only corporation which is empowered, or is ever likely to be empowered, to regulate the education and qualification of pharmacists, or in other words to uphold and, as we hope, to exalt the standard and dignity of pharmacy. The Society may, it is true, fall short of its obligations; it may become apathetic or even obstructive; it may become selfish and forget its high duties as the guardian of scientific pharmacy and the trustee of the public welfare in connection therewith; it may take a low view of its responsibilities and grasp vainly at some illicit advantages which are not consistent with these higher aims; and by so doing you may say that it has forfeited your allegiance. But remember, if it does these things it will be the fault of its members, or of those who should be members but are not. The Society *is* what its founders and many worthy successors *have* made it, it *will be* what you and those who follow you *shall* make it. Take heed, therefore, that you neither negligently, disloyally nor wilfully detract from the high character which has been impressed upon it by other hands than yours; for of this be sure that if the Society fails there is none other power to which English pharmacy can look for rescue. Above all things see that you do not entrust its government to unworthy hands.

The Society being now launched, the work of organization proceeded briskly. A school of pharmacy was established, comprising a laboratory for instruction in practical chemistry, which it may astonish many of you to hear was the first of the kind opened in this country; also a library and museum, with the extensive resources of which you are doubtless familiar. Lectures were instituted for which the services of eminent professors were secured—I need only mention the name of Dr. Jonathan Pereira—and finally examinations were arranged as a means of admission to the Society for all engaged in the pursuit of pharmacy who chose to submit themselves to the ordeal.

But the Society was now, and remained for many years, a merely voluntary Association, and had nothing to offer to those who satisfied the examiners beyond a bare certificate of membership, which conferred no more substantial privileges. Those who sought pharmaceutical education for its own sake accepted the opportunities offered with alacrity, and thought themselves amply rewarded; but those who hankered after more solid pudding, according to their notions of substance and shadow, flattered themselves that they were not to be caught with that hollow sort of chaff. Obviously such an organization as this was not competent to effect any marked or immediate improvement in the general aspect of pharmacy. It is not true that all mankind, or even the majority, are possessed of an insatiable thirst for knowledge. And, alas! pharmacists are but men.

It is rather to be wondered at that the Society effected so much within its narrow powers, than that it did so little. By means of evening meetings held in Bloomsbury Square for scientific papers and discussion, by the publication of the *Pharmaceutical Journal* and by some other less conspicuous agencies, the influence of the Society began to be disseminated, and a considerable awakening in practical pharmacy, to be followed in due course by signs of more scientific activity, became apparent. The example of London spread to the provinces, where local associations with similar objects sprang into existence, and attention began to be directed to the scientific aspect of the vocation which had hitherto been followed according to the good old rule of thumb.

In this way the Pharmaceutical Society made itself known and respected not only by its own members, but by members of the medical profession, whose good opinion it was and is most desirable to conciliate. They were in those days frequent attendants at the evening meetings in Bloomsbury Square, and often took part in the discussions. Of late years they have been conspicuously absent, which is to be regretted. It was a pleasing incident of the last evening meeting, and strongly suggestive of the good old times, to meet a medical gentleman there who contributed valuable remarks to the discussion of a subject which lay between pharmacy and therapeutics.

The Society became also favourably known to the Government, and slowly but surely laid the foundation for that influence which it has since exercised with good effect upon various legislative measures, which would otherwise have passed through Parliament in a form not only objectionable to chemists and druggists, but also prejudicial to the interests of the public. Even so early as 1841, that is, in the first year of the Society's existence, the Home Secretary consented to recognize it as the representative of the trade, and undertook that no legislation upon medical reform should be proceeded with without notice to the President. This was an important point gained, and contrasts strongly with the unrecognized position held by the unassociated chemists and druggists of former times. Thus within the short space of a few months had this purely voluntary, and as yet unlicensed, Association come to be a political power.

As soon as the Society felt itself fairly established and could point to good work in full operation, it made the first move towards consolidating its position by applying for a Royal Charter of Incorporation. This explosive strategic movement was appropriately executed on November 5, 1842, by petition to the Queen, which was "graciously" received, and the *ci devant* private association became a chartered corporation with perpetual succession, common seal, right of suit and such like incidents of a Royal grant, on February 18, 1843.

The Royal Charter forms the second important epoch in the progress of the Society. But the powers of a Royal Charter in these days of constitutional Government are, properly, very limited; and the Charter neither did nor could confer upon the Society any authority over persons outside its own list of members. It left it, as it found it, a purely voluntary Association; and none knew better than the leaders of the Society, who had petitioned for the Charter, that larger powers were needed, which only an Act of Parliament could give, to enable them to carry out their views for the regeneration of pharmacy. They knew this—they knew also that "everything comes to the man who waits." Accordingly they took for their text the familiar motto of the Onslows, "Festina lente," which has been happily translated into the vernacular as "Go it, ye cripples." And they waited and watched.

As the years rolled on the necessity for further powers grew more apparent and seemed to come more within the range of practical politics; but the long incubated Medical Bill stopped the way and gave time to trim the Pharmacy Bill into shape before it was eventually presented to Parliament in 1851. Let me take advantage of the lull during these eight years to introduce a personal recollection of another great Charter, which was mixed up with the School of Pharmacy in a manner deserving a place in the page of history.

In the session 1847–8 my connection with the School of Pharmacy commenced. The year 1848 was politically remarkable. A democratic wave swept over the Continent, tumbling thrones in the dust, and driving their royal occupants across the Channel in menial disguise, exposed to the perils of the sea in open boats, to seek refuge in the greater stability which England owes to her free institutions. But even here there was a faint reverberation of the convulsion that was shaking Europe to its foundations. April 10, 1848, was fixed for the great Chartist demonstration to perambulate the streets of London in force from Kennington Common to St. Stephens, there to carry the great Charter to the very doors of Parliament with throng and tumult, in flagrant

defiance of the statute in that case made and provided. But the boys of Bloomsbury Square were equal to the occasion. They rose up as one man; were sworn in at St. Giles' Church, and with the staves of special constables in their hands and loyalty in their hearts mustered under the leadership of their professor, who gallantly headed them under his umbrella! for the day was drizzly, and severely tried though it could not damp the ardour of the specials. And now you know by what means London was saved and the constitution preserved from outrage. The public buildings were garrisoned with troops; the Bank was fortified with a breastwork of sand bags, loop-holed for musketry. But these precautions were needless, the perils and the honours of the day were with the "specials," to whom the School at Bloomsbury furnished its heroic contingent, as the treasured relic now lying upon the table (being the staff that I carried on that memorable day) will testify.

In the years 1848–50, the Society was busy in maturing its first Pharmacy Bill; but the Council were met at the outset with a serious obstacle. It was impossible to find a member of Parliament with sufficient knowledge of pharmacy, of its wants, its claims and its peculiar relation to the medical corporations and to the public, to whom the conduct of the Bill through Parliament could be prudently entrusted. It was obvious that an efficient advocate must possess a competent knowledge of "Pharmaceutical Politics," and where amongst the representatives of the nation was such an advocate to be found? This was a perplexing question, to which no ready answer was forthcoming.

On the other hand there was one circumstance that greatly favoured the Society's movements. The Sale of Arsenic Act had been brought before Parliament in 1850. The Pharmaceutical Society, by means of their organization, had collected valuable statistics relating to the trade in arsenic, though it was the Provincial Medical Association who had first raised the question and who now brought it under the consideration of the Government. The Government took charge of the Bill and brought it in as a Government measure, and in the course of the inquiry, the chaotic state of pharmacy came so prominently under notice of Parliament as to encourage the hope that the evils might be remedied by speedy legislation. Thus early did the sale of poisons mix itself up with the question of pharmaceutical legislation.

Finding that there was no chance of securing the assistance of a member of Parliament whom the Society could trust to pilot the Bill through the House, Mr. Jacob Bell took the bull by the horns and determined to look for a vacant seat since the full ones would not help him. Accordingly he became a candidate for the representation of St. Albans, for which town he was elected member after a severe contest. It is amusing to hear that he had decided upon offering himself as a candidate before he had made up his mind to which political party he belonged; but as it was necessary that he should espouse the principles of one or the other, he was not long in coming to the conclusion to appeal to the constituency as a Liberal, which in the best sense of the word he certainly was. Liberality went a long way in St. Albans, and Mr. Bell was returned.

And now I can no longer postpone an obligation from which I have hitherto shrunk from conscious inability to deal with it creditably. I have not, until now, mentioned the name of Jacob Bell in connection with the formation and direction of the Pharmaceutical Society. Yet it is well known that Jacob Bell was the moving spirit in it all; and his name, his work and his memory have been present to my mind with every line that I have penned. Mr. Bell had able and influential colleagues, who did good service and whose services are held in grateful remembrance, as they deserve to be. They did all and more than all that patriotism could reasonably claim from them. But Jacob Bell was more than this. He gave, without stint, his time, his talents, his means, and, alas, he finally sacrificed his life to the object with which the best years of his life had been identified. If you read the first part of the 'Progress of Pharmacy' written by his hand—and everyone who wishes to understand pharmaceutical politics should read the whole of it—you will see that no name is less prominent in the early proceedings of the Society than that of Jacob Bell. This is not solely due to the modesty of one who writes of events in which himself played the leading part, for you will find that he as studiously kept himself in the background while those events were passing. You will never read of Mr. Bell as the chairman of a meeting; it is always someone else, whose co-operation he desired to secure. I think you will never meet with his name as the mover or seconder of a resolution. He was careful that the distinction attending these little ceremonies should fall upon the shoulders of others. This was not affectation; it was downright, genuine unostentatiousness. Jacob Bell was the most unselfish man I ever knew, and I am proud to say I knew him well. Yet whenever there was real sustained hard work to be done,—no mere flash in the pan,—and from which no *κύδος* was to be expected, it was Jacob Bell who did it. It was he who toured the provinces, holding meetings, making himself all things to all men if only he could thereby stir up their sympathies to co-operate in the great work upon which he had set his heart, though he had no selfish benefit to reap. It was he who projected the *Pharmaceutical Journal* and edited and published it at his own risk for twenty years, finally handing it over, a valuable property, to the Society to which he bequeathed the copyright. The Journal, perhaps, did more at this time to extend the reputation and influence of the Society in the provinces than all other agencies put together, and it still continues to be its most valuable organ and auxilliary; for this we are indebted to the enterprise and generosity of Mr. Bell. I do not attempt to eulogize him. I feel how inadequate any words of mine must be to do justice to his worth, his ability, his liberality, and to his complete devotion to the cause of pharmacy. I also feel that such words, could they be spoken, are entirely unnecessary; for wherever English pharmacy is known, there the services of Jacob Bell are remembered, and his memory is revered. He has long ceased to be with us, alas! and there have been times when the want of his influence has been grievously felt. "But though dead he yet speaketh," and the echo of that silent speech may be felt by all who will put aside suggestions of self-interest and open their hearts to a broad conception of the duty that lies before them—the duty of loyalty to a worthy cause.

(*To be continued.*)

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of this Association was held on Thursday, March 29, Mr. R. H. Parker, Vice-President, in the chair.

A paper was read by Mr. J. B. Barnes, on "Vortmann's Method for the Separation of Chlorides, Bromides and Iodides," which will be published in a future number of this Journal.

In the discussion that followed the Chairman, Secretary, and Messrs. Crow, Dymond and Elworthy took part.

A vote of thanks was accorded to Mr. Barnes.

The Reporter on Botany, Mr. J. O. Braithwaite, then made a report on "Plant Movement."

A discussion followed in which the Chairman, Secretary, Messrs. Crow, Elworthy, Rankern, Ransom, Reynolds and Taylor took part.

Parliamentary and Law Proceedings.

Alleged Death through a Cough Mixture.

An inquest was opened at Brighton on Wednesday, March 28, touching the death of Arthur Long, aged eighteen months. The mother stated that on Sunday evening she obtained some cough mixture for the child from Mr. Goyne Stevens, chemist, in North Street, and the dose as stated on the label was a teaspoonful three times a day. She gave the child one dose at half-past seven and another at twelve o'clock. In the morning upon going to the child's bed she found it was dead. She used an ordinary teaspoon.

Dr. Ross, who had been called in, said he had made a *post-mortem* examination of the body and he was of opinion that the child died from an overdose of morphia.

Mr. William Goyne Stevens, chemist, 53, North Street, said the mixture had not been dispensed by him and he was much surprised to learn that it had been supplied, since he always declined to give medicine of the kind to children. It was a mixture kept for coughs in the case of adults. According to the manner in which the assistant had told him he prepared what was given to the child's mother there would be one 120th part of a grain of morphia in each measured teaspoonful. Looking at the bottle he found that there were four doses gone, instead of two. The spoon produced was not a teaspoon, but it would hold double the ordinary dose; the old silver teaspoon was the type of what the measure should have been. The mixture had been supplied against his general instructions not to give morphia or any dangerous drug to children. There would only be one-eighth of a grain of morphia in the whole bottleful.

The inquest was adjourned to allow of an analysis being made of the remainder of the medicine in the bottle.—*From the Sussex Daily News.*

Correspondence.

"Quackery Rampant."

Sir,—Under the above heading, your contemporary, the *Lancet*, in the spirit of justice and fair play it usually adopts when speaking of chemists, says in its "Annotations," March 17, at page 463, after a diatribe against quackery and quack medicines, that "The real cause of this evil is the counter practice of the druggists." The *Lancet* then goes on to demonstrate the ignorance of the druggist, and suggests that the public, especially the poorer classes, should be educated so as to be able to discover this ignorance, by which they are misled and induced month after month to squander money and waste precious time in the futile attempt to get cured of their disorders. On the face of this, one would be tempted to think that perfection, or at any rate something like it, would at least be found among the class of men represented by the *Lancet*, yet what do we find?

Turning again to the same number, on page 461, we find a leader on the "Testing of Urine," called forth by some demonstrations given by Drs. Pavey and Oliver, and following a mass of correspondence on the same subject in its own pages. In this article the writer says, "It is a platitude to insist on the importance of this branch of clinical investigation, and yet we do not exaggerate when we say that no part is more generally neglected or more perfunctorily made." It would seem, therefore, that the charge of "knowledge defective as regards disease" is not always confined to the druggist, but, diagnosis being at fault, may exist also in the medical man.

Again, one would suppose, after so severe a denunciation of "quack medicines," that the *Lancet* itself would be above reproach. But what do we find? Still in the same number, on page 458, under "Analytical Records," a list of secret preparations, with the names and addresses of the makers attached, the composition of some of which is, according to the *Lancet's* own admission, known only by advertisement, and yet that Journal does not hesitate to recommend them. If this is not advertising advertised secret—which can be only another name for quack—medicines, may I ask what is? Can there be any moral difference between a patient taking a remedy prescribed by a chemist who knows at least something about it, and the same patient taking a remedy prescribed by a medical man who knows nothing about it, except that it is advertised in the columns of the *Lancet*?

South Norwood, S.E. J. H. Baldock.

The Constituents of Cacao Oil.

Sir,—I have had under my notice a letter from Mr. Kingzett respecting an investigation of cacao oil carried out by me, which induces me to make the following reply.

Mr. Kingzett, without making himself acquainted with the contents of my original communication, notwithstanding that the necessary reference was given in the abstract in question, has cast doubt upon the correctness of the facts experimentally demonstrated by me. I therefore dispute the right of Mr. Kingzett to exercise criticism upon the basis of a report in which only the results of my investigation are given, since he is ignorant of the grounds upon which I formed my opinion that the arachic acid which he declared to be a mixture was a single body.

I maintain against Mr. Kingzett and against any other opponent the accuracy in every respect of all the results obtained by me in my investigation of the subject of cacao oil, and at the same time I here state that I would give further consideration only to criticism supported by facts.

Mr. Kingzett's offered acid I decline, since I could not be influenced by the analysis of a body, as to the origin of which I had not personally satisfied myself.

Whilst, in conclusion, I assure Mr. Kingzett that I do not require instruction from him upon the criteria of an individual body and a mixture, I would refer him in any case upon the subject he is interested in to my original communication (*Archiv der Pharmacie*, 1883, p. 19).

M. C. Traub.

Bern, Laboratory of Professor Percenoud.

W. J. W.—(1) The test is worthless. (2) Gynogardic acid is an acid first separated from chaulmoogra oil by Moss. See *Pharm. Journ.*, [3], x., 251.

Inquirer (who should have sent his name and address) is recommended to consult his legal adviser as to the possibility of evading the provisions of the Pharmacy Act.

G. S. Boutall.—We do not think any useful purpose will be served by giving to the handbill in question further publicity by reproducing it in these columns.

G. Agar.—We are unable to insert requests for assistance in imitating specified proprietary preparations.

J. W. L.—See a note by Dr. Symes in last week's Journal, p. 819; also Dr. Thresh's communication in vol x. (1879), pp. 193 and 260.

A. E. Welch.—It is not legal for any unregistered person to sell by retail poisons included in the schedule to the Pharmacy Act.

"*Health.*"—(1) We are unable to identify the recipe referred to. (2) Rubini's preparation is said to be a solution of camphor in its own weight of 60 o.p. spirit.

A.P.S.—There is no recognized preparation, though a liquid extract and a tincture have been used, and sometimes the drug has been administered in powder. See *Pharm. Journ.*, vol. x. (1880), pp. 521, 541.

Omega.—(1) The coloration of the solution of acetate of morphia referred to is the result of some decomposition, though this has been stated not to affect the medicinal properties of the salt until the colour becomes intensely yellow. (2) The preparation should certainly not be substituted for the B.P. tincture. (3) Submit the questions to the Inland Revenue authorities. (4) A wine licence is necessary—see *Pharm. Journ.*, June 24, 1882, p. 1060. (5) The subject is not dealt with in the Draft Pharmacy Acts Amendment Bill. As to this and the following question see the Bill printed before, p. 644.

Communications, Letters, etc., have been received from Messrs. Symes, Buchanan, Winter, Paris, Cock, J. W., Associate.

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TRADE MARK.

A.D. 1715.

Allen & Hanburys desire to call the especial attention of the Profession to this article. The very considerable quantities required for certain dietetic articles, manufactured under letters patent with Allen & Hanburys Extract of Malt, and the increasing demand for the Extract itself, have recently induced them to enlarge and improve their vacuum and other special apparatus for the production of the article, and they are now prepared to supply a very large demand. From the quality of the malted grain employed, and the care bestowed on the details of manufacture, including special temperatures throughout the process, Allen & Hanburys can with confidence recommend as unsurpassed in its flavour, nutritive value, and power of liquefying gelatinised starch, whilst they claim that it possesses the following advantages over other extracts in the market, under whatever name they may be sold :—

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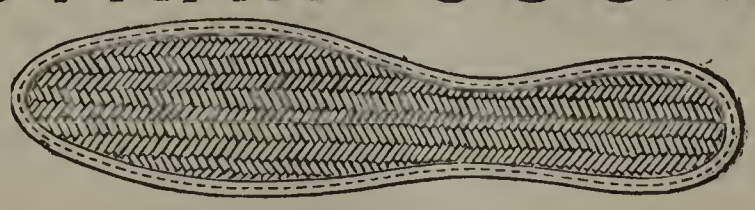

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The Pharmaceutical Journal AND Transactions.

THIRD SERIES, No. 669.] SATURDAY, APRIL 21, 1883. [PRICE FOURPENCE.

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Pharmaceutical Society of Great Britain,

17, BLOOMSBURY SQUARE, LONDON.

ELIAS BREMRIDGE, Secretary and Registrar.

NOTICES.

SPECIAL NOTICE.

Monday, April 30th, is the last day on which the Secretary can receive Subscriptions.

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SECTION 1, CLAUSE 10.—"All Subscriptions for the Current Year shall become due upon election, and *all Annual Subscriptions shall become due on the first day of January in every year;* and if any Member, Associate, or Apprentice or Student shall not have paid his annual subscription before the first day of May in any year, his name shall be omitted from the Register of Members, Associates, and Apprentices or Students of the Society certified by the Council at the Annual Meeting."

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INDEX TO THE PHARMACEUTICAL JOURNAL FROM JULY, 1868, TO JUNE, 1878.

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OF THE

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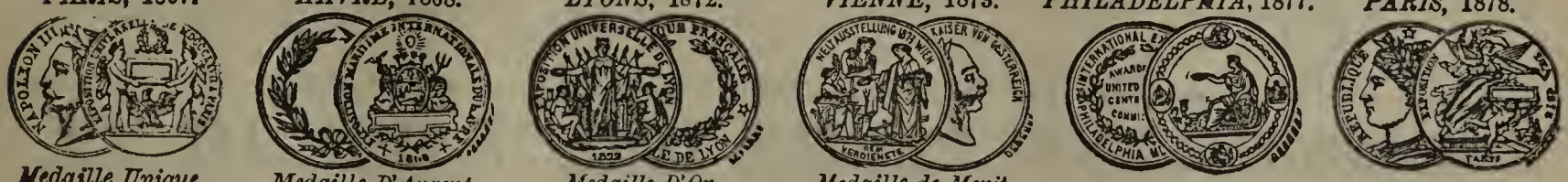

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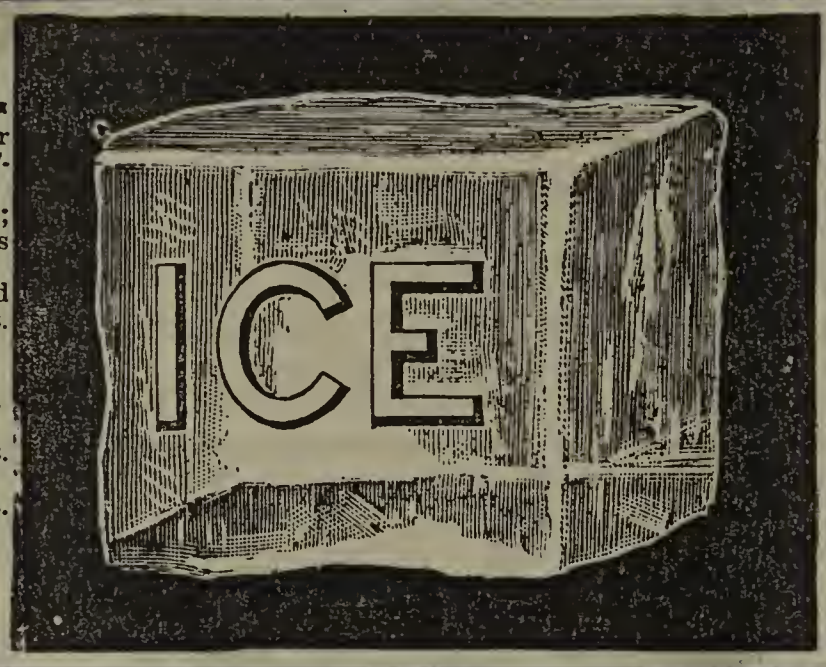

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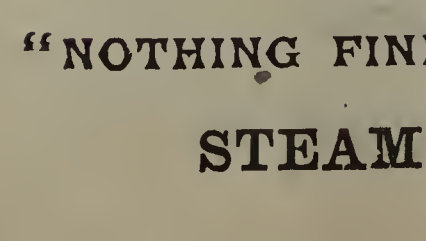

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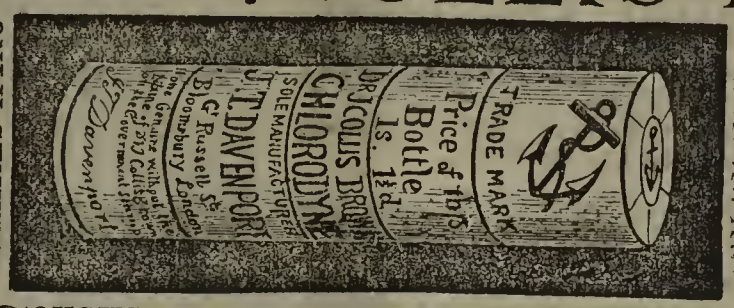

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VICE-CHANCELLOR SIR W. PAGE WOOD, by whom the suit in Chancery was first heard, stated, in his judgment, that "Dr. J. Collis Browne was undoubtedly the Inventor of Chlorodyne, that the whole story of the Defendant Freeman was as deliberately untrue as the falsehood he had deposed to with reference to the use of his Chlorodyne in the Hospital."

THE VICE-CHANCELLOR also stated, "that Chlorodyne was a fanciful name, and had application been made sooner, the Court would have given Dr. Browne protection."

LORD CHANCELLOR SELBORNE coincided with the judgment of the Vice-Chancellor upon this point, and stated "that had application been made at a proper time and place, the Court would have found means to restrain the Defendant from misrepresenting the decision of the Vice-Chancellor."

LORD JUSTICE JAMES on appeal stated, in his judgment, "that the Defendant Freeman had made a deliberate misrepresentation of the decision of Vice-Chancellor Wood."

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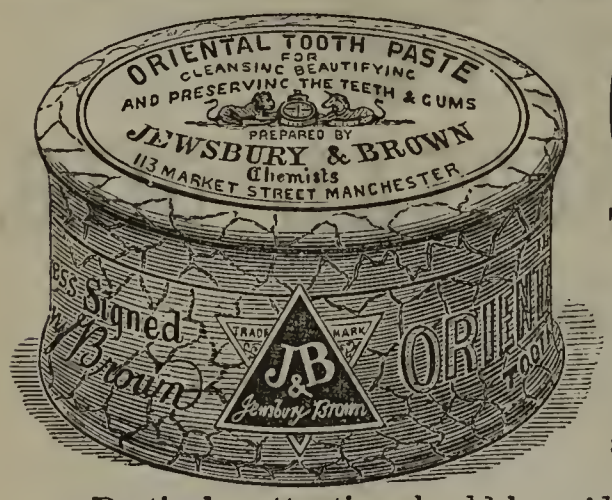

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One Penny size	per gross	2/–	...	2/6
Threepenny size	,,	3/6	...	5/–
Sixpenny ,,	,,	5/–	...	8/–
One Shilling ,,	,,	8/–	...	10/–

With Rotary tops, per gross, 6d. size, 9/–; 1/– size, 12/–

Bellows, with piston blower ... ... 5/6 per doz.

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Parchment Paper.
Very thin. Superior to Wax Papers for Wrapping Greasy Articles, or for Cold Cream Pots; and a quarter of the price, 1/– per quire. Cut to size for 1 lb., 2 lb., 4 lb. pots. Per doz. packets, of 3 doz. 4/-, 6/-, 8/-, doz.

Perfume or Spirit Flasks. Nickel plated top. Cut Glass, 10/6 per doz.

Pill Coater, "Simple." (Symes'). For coating small quantities of Pills with ease and perfection, 4/6 each.

Saline Bottles (with Plug Stoppers). Lamplough's size 18/–; Eno's 18/–, per gross. Handsome Wrappers for ditto, 7/6; Labels, 1/6 per 100.

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"Sparadrap Agglutinatif" (French Sticking Plaster). Always soft and pliable. Does not irritate the skin. Will adhere to a fresh wound. Contains no resin or turpentine. Does not discolour, 10d. per yard.

Sponge Bags (Check Waterproof).
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6/6 8/– 9/6 11/6 13/– 15/– 18/– 20/– per doz.
Ditto, with pocket, per doz. 21/–
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Tooth Paste. Cherry, 4/–, 8/–; Areca, 4/–, 8/– per doz.

Tube Brush. New pattern. The Brush is in the centre of the wire, 4/6 per gross.

Tube Cleaner. Patent Wire. Marshall's Patent. All metal, on a card of 2 doz., 1/6 per doz. Also in boxes containing 1 gross, to retail at 1d., 9/–

Vaccination Shield (Cowan's). The original. For protecting the child's arm after Vaccination. Reduced prices, 3/3, 6/6, 13/– per doz.; sell at 6d., 1/–, 2/–

Vagina Syringes. Dr. Rowe's, with glass mounts, white balls, 18/–; ditto, green balls, 21/–; Dr. Rowe's with elastic gum mounts, green balls, 21/– & 24/–; ditto, ditto, white balls, 14/– per doz.

Vials. Packed in wooden boxes containing 1 gross, for safety in transit and for convenience in storage. ½ oz., 4/–; 1 oz., 5/–; 1½ oz, 6/–; 2 oz, 7/– Special quotation for 50 or 100 gross lots.

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FULLY ILLUSTRATED PRICE LIST ON APPLICATION.

THE PREPARATION AND COMPOSITION OF UNGUENTUM HYDRARGYRI NITRATIS.*

BY THOMAS MABEN,

Pharmaceutical Chemist.

In the course of an investigation in connection with olive oil and its adulterations, several reactions which I have noted seem to throw some light on the causes of the variability in the properties of citrine ointment, as prepared by the official process. These reactions occur in subjecting the oil to the action of a solution of mercuric nitrate in excess of nitric acid, in the presence of heat, and without anticipating what I may, at some future time, submit to you regarding the subject for which the experiments were initiated, I may cite the following results as furnishing some explanation of the causes of the variability referred to.

Effect of Acid Solution of Mercuric Nitrate on Olive Oil at Different Temperatures.

1. When pure olive oil is heated with the mercury solution to 180° F., moderate chemical action takes place, the mixture frothing up to a small extent only, and solidifying on cooling.

2. When the mixture is heated to 212° F. the chemical action is much more decided, the result in general appearance being similar to that in the former case, but with this difference, that a small quantity of a yellow semi-crystalline substance is precipitated.

3. The mixture heated to 300° F. gives very energetic action, the solidified cooled mass presenting much the same appearance as before, but with an increase in the quantity of yellow precipitate.

4. When olive oil adulterated with any of the common seed oils is heated with the reagent, the mixture at 180° F. assumes a reddish colour, due to the action of the nitric acid on the foreign oil; at 212° F., a slate-coloured precipitate, which seems to vary in quantity according to the extent of the adulteration, is thrown down, together with a quantity of the yellow precipitate already mentioned; at 300° F., the quantity of slate-coloured precipitate is increased, but no further change is noticeable.

5. The yellow precipitate is insoluble in ether and alcohol, but is slightly soluble in water, and gives mercurous reactions; it is evidently mercurous nitrate. The slate-coloured precipitate is unaffected by these solvents, but is dissolved by nitric acid, and is apparently mercurous oxide thrown down by the reduction of the mercurial salts in the presence of the foreign oils.

6. A portion of No. 1 treated with ether is found to be entirely soluble; portions of Nos. 2, 3 and 4, similarly treated, are found to be partially soluble only, the precipitates being insoluble.

In view of these reactions, there would be no difficulty in our assuming that substantially the same results would follow in the case of citrine ointment, but for the introduction of the new ingredient, lard. Actual experiment has shown, however, that the analogy is all but complete, as we shall find if we compare the *data* already given with the results obtained when the ointment is prepared at different temperatures, results which explain several phenomena that have not, so far as I am aware, been elucidated, while they tend to reconcile the conflicting statements which have been made regarding this preparation.

Effect of Different Temperatures in the Preparation of Ungt. Hydr. Nitrat.

A. When citrine ointment is prepared at 180° F. we have a beautiful, somewhat transparent, lemon-coloured ointment, of a soft consistence, and soluble in ether.

B. Prepared at 212° F., the ointment is rather less transparent, not quite so soft, and only partially soluble in ether, a small quantity of yellow precipitate being insoluble.

C. Prepared at 300° F., the colour is the same, but the ointment has a denser appearance, and is much harder. The yellow precipitate is, as in the last instance, insoluble in ether.

D. When the olive oil has been adulterated even to the extent of only 5 per cent., the appearance of the ointment is quite changed. Instead of a lemon colour, it has now acquired a distinct greenish hue, while with a larger percentage of foreign oil, this is still further intensified. The red colour visible in the case of the adulterated olive oil is not now so apparent, it being disguised on the one hand by the lard, and on the other by the mercurous oxide.

Coming now to the consideration of these facts, there are three points to which I desire to direct your attention, viz., the composition of the ointment, its colour and consistency, and its liability to deteriorate, regarding all of which there is no little difference of opinion.

I. *Composition.*—Pereira states that "by the action of the fatty bodies on nitrate of mercury, the latter is transformed into a yellow subnitrate of the protoxide of mercury, a small portion of elaïdate of mercury being also formed."*

Christison says the ointment "is believed to be a mixture of oleic and stearic acids, elaïdic acid and nitrate of binoxide of mercury."† Mr. Schacht, in an account of several experiments, says:—"A portion of best ointment treated with a large quantity of ether dissolved entirely. Samples possessing inferior external properties deposited a yellow powder perfectly insoluble in ether, which proved to be nitrate of mercury;"‡ his conclusion, therefore, evidently being that *good* citrine ointment contains *no* nitrate of mercury. Mr. Martindale, adopting, with most other authorities, Pereira's view, states that the ointment "contains a complex mixture of basic nitrate of mercury, elaïdin, fatty acids in combination with mercury, etc."§ These are only a few of the different opinions that might be cited, and the question seems to turn on this point, viz., Does the mercury in citrine ointment really exist in any quantity as nitrate, as the B.P. name implies, or is it entirely combined with the fatty acids? From the results that I have submitted to you it will be apparent that both views may be regarded as being correct. The B.P. directs no definite temperature to be observed, and till it does so pharmacists are left to their own judgment. If one ointment

* Read at an Evening Meeting of the North British Branch of the Pharmaceutical Society, April 11, 1883.

* 'Materia Medica,' 2nd edit., p. 769.
† 'Dispensatory,' p. 531.
‡ *Pharm. Journ.*, [1], vol. iv., p. 450.
§ *Pharm. Journ.*, [3], vol. xi., p. 912.

is prepared at 180° F., and another at 212° F., both may be citrine ointment, and excellent preparations, but both cannot strictly be said to be *unguentum hydrargyri nitratis.*

The theory which commends itself to my mind, as accounting for this double result, is that a reaction takes place somewhat after the following manner: The effect of the nitric acid is to resolve the fats into their proximate constituents, viz., glycerine, stearic acid and oleic acid, the latter, according to most authorities, being transformed into elaïdic acid. In the presence of these acids mercuric nitrate is, at a low temperature, split up, the mercury uniting with the elaïdic acid to form elaïdate of mercury. On the temperature being raised this salt is partly decomposed, but the excess of nitric acid being at the same time driven off, there remains only sufficient to combine with the liberated mercury to form mercurous nitrate, which is, as we have already seen, precipitated. Oleate of mercury is practically insoluble in ether, and it is highly probable that the palmitate and stearate will be of a similar nature in this respect, and this has led me to the conclusion that the mercury exists as elaïdate, until that salt is decomposed or partially decomposed by the higher temperature.

Perhaps it is too much to expect that this theory will meet all the difficulties of the case, but I submit it to you, as a probable explanation of the reaction that takes place.

If the ointment is prepared at a low temperature the excess of nitric acid will not be driven off. Most of you, if not all, will have observed an acid liquid at the bottom of the shop jar, or even sweating out of the ointment itself. This is certain to be present if the temperature does not exceed 180° F., and even at 212° F. the excess of acid is occasionally not all driven off. Mr. Donovan* complains of this excess in the B.P. preparation from a therapeutical point of view, and we can easily understand that needless irritation will be caused to a tender surface by its presence.

It is thus possible to have two distinct citrine ointments, the one containing fatty acids, elaïdate of mercury and mercurous nitrate, the other composed of fatty acids, elaïdate of mercury and excess of nitric acid. If we wish to follow Mr. Schacht's idea of a good ointment, we are certain to displease Mr. Donovan by excess of acid; on the other hand, if we eliminate the acid by increasing the temperature we at the same time cause the formation of mercurous nitrate. Further, if it is admitted that the B.P. means the ointment to contain nitrate of mercury in some form it is clear that it ought so to be prepared that it will really be what it professes to be. For these reasons, therefore, it is perfectly evident that the B.P. ought to state the temperature definitely, as until this is done the composition of the ointment is liable to vary, it being quite as likely to be *ungt. hydr. elaïdatis* as *ungt. hydr. nitratis.*

II. *Colour and Consistency.*—I have already anticipated, to a certain extent, the remarks that naturally fall under this head, and would simply repeat that at whatever temperature the ointment is prepared, the lemon colour is the same, provided pure oil is used. The only visible difference is that the lower the temperature the more transparent does the ointment appear to be. If the oil is impure, the colour is darker and of a greenish hue, owing to the action that has been already explained. Ointment prepared at a high temperature, say 300° F., is considerably harder than that prepared at 212° F., or 180° F., though there is little difference between the two latter.

III. *Deterioration.*—If citrine ointment becomes discoloured early, say within a few months, the presumption is that the oil was not pure, always granting, of course, that due precautions had been taken in its manufacture and preservation. This is more especially likely to be the case when the discoloration is homogeneous or regular and the ointment preserves its consistency. We have seen that the mercury is reduced by the action of the foreign oil. This reduction takes places rapidly at a high temperature, but we may justly infer that the same action goes on more slowly at normal temperatures. As an illustration of this, here are two specimens adulterated with equal quantities of the same oil,—10 per cent. rape. The one has been prepared at 180° F., and the other at 212° F., and while the former is of a bright yellow, the latter has the characteristic green hue. An ointment may therefore be satisfactory as regards appearance when it is newly prepared; but this is no guarantee that it will not deteriorate, as I venture to assert this yellow specimen will do ere long. This contingency (of impurity) has been very much overlooked in connection with the ointment, and it is quite possible that to it, rather than to unskilful methods of preparation, is referable in many cases its liability to deteriorate. Mr. Schacht's theory was that the reduction of the mercury was due to the evaporation, in course of time, of the nitric acid; and he proved it so far, by adding acid to a discoloured sample and restoring the ointment to its original appearance. This is correct enough, as far as it goes, because, by adding more acid you merely redissolve the mercurous oxide, and practically re-prepare the ointment; but it does not afford sufficient grounds for the general inference drawn from it. The difficulty lies in the fact that when those adulterated ointments are heated to 212° F., discoloration takes place, while this pure ointment retains its colour though heated to over 300° F. If, in the former case, all the acid has evaporated, much more must this be true in the latter, yet no discoloration is visible; on the contrary, it is, so far as appearance goes, the best specimen on the table.

In concluding this paper, let me say that there should be no difficulty in turning out an elegant and durable preparation by the B.P. process, and I am strongly of opinion that an ointment carefully made with pure oil and good lard, according to the directions there given (interpreting "hot" as at least the boiling point of water), will keep for a very long period indeed, without deteriorating in the slightest. With the exception of this indefiniteness as to temperature, the B.P. formula, which is practically that devised by the late Mr. Duncan, is as near perfection as it possibly can be.

In view of a new edition I would suggest that it be made complete in this respect, and that the temperature fixed ought not to be less than 212° F.—it might with advantage be even more—so that there may be uniformity, not only in the appearance of the ointment, but, what is of more importance, in its composition.

* *Pharm. Journ.*, [2], vol. vi., p. 541.

NAPHTHALIN AS A WOUND-DRESSING.*

BY G. R. FOWLER, M.D.

The most recent, as well as the most promising, addition to our means of combating sepsis in all its varied forms in wound treatment is that which has been brought forward by Lücke, of Strasburg. The agent proposed by Lücke is naphthalin, a product of the distillation of coal-tar, and it is to the claims of this article as an antiseptic in the treatment of wounds that attention is now invited.

Naphthalin, in a pure state, is a white substance, occurring in laminated crystals; its formula is given in works upon chemistry as $C_{10}H_8$. It forms wherever organic bodies, especially those containing an abundance of water, are burned. Coal-tar contains it in large quantities, and it is obtained by subjecting this substance to distillation. It passes over after the coal-oils, and it is produced by passing the vapour of coal-tar through red-hot tubes. It is derived from the residue of gas manufactories, and not unfrequently clogs up our gas pipes. In its crude state it is a brownish-yellow, sand-like substance, containing an indefinite quantity of the phenols. It may be purified by sublimation with charcoal, and, as before stated, when in a pure state is a white crystalline body. It has an odour decidedly like that of coal-tar, and a slightly aromatic taste; its specific gravity is 1·05; it is volatile at any temperature, but melts at about 176° F., and crystallizes upon cooling; it boils at 420° F. It is inflammable, and burns with a lurid, smoky flame. It is but sparingly soluble in water and in the secretions of wounds, but its gaseous vapour is given off readily at the temperature of the body, and especially when in contact with moist surfaces; it is likewise insoluble in alkaline and acid fluids; it is readily dissolved by ether, hot alcohol, hot concentrated sulphuric acid, and the different ethereal and fatty oils. It is deposited from its alcoholic solution in white lamellar iridescent crystals. In the sulphuric acid solution a sulpho-naphthalic acid is formed. Naphthalin combines with chlorine, producing two chlorides; these latter, upon further investigation, may prove serviceable and available as germicides. When exposed to a temperature of 300° F., naphthalin sublimes quite rapidly in thin scales, and the atmosphere of a room can be thoroughly saturated with it in a gaseous state by simply adding some of the crystals to water and heating it. If the latter be continued for some time, naphthalin will be precipitated upon the walls of the apartment. If crystals of naphthalin are simply strewn upon the floor, the same result will take place, only more slowly. Nearly all of the samples obtainable contain more or less of the phenols as an impurity. The following test for pure naphthalin has been suggested by Dr. Schulte, of Strasburg: Dissolve a small quantity of naphthalin in a weak solution of chloride of sodium; heat to a boiling point—cool, and filter. If the filtrate is made slightly acid and a watery solution of bromine is added, phenol being present in small quantities, a milky condition of the fluid appears; if present in larger quantities, a more dense white precipitate, the bromide of phenol, is formed.

Naphthalin produces no poisonous effects upon man and the higher animals when given internally or applied to large absorbing surfaces, but it is most efficiently destructive of low vegetable and animal organisms, such as fungi, spores, small insects, etc. The preservation of meats, after exposure to smoke, is partially due to the influence of this body. It, therefore, belongs to the class of germicides, and bids fair to prove of value as an aseptic and antiseptic in the treatment of wounds.

In my own experience with naphthalin I have noticed that when it is used in an aseptic manner, that is to say, when it is brought in contact with fresh wounds that have never been in a septic condition, they continue in an asceptic, and consequently in a healthy state; and that septic and unhealthy wounds, indolent ulcers, ulcerating cancers, growths, phagedenic chancres, etc., rapidly assume a healthy appearance when its antiseptic action is brought to bear upon them. This is due, without doubt, in the first place to an efficient protection of the wound from septic influences, and in the latter instances to a complete and thorough disinfection of the wound. Its application does not interfere with free drainage from wound surfaces; in a powdered state it may be applied directly to the cavity, or over the parts, after suturing the edges. Serum and blood will percolate through it precisely as they would through sand. As an additional advantage, it does not unite with wound secretions to form crusts or scabs.

I have found, as a simple and convenient method of employing naphthalin, that of using it in substance, finely powdered. After thoroughly disinfecting the wound—if it is not already aseptic—and surrounding parts with a solution of carbolic acid or chloride of zinc, suturing and making proper provision for drainage, I cover the parts to be dressed with a narrow strip of oil-silk previously dipped in a one to forty solution of carbolic acid, and having a perforation here and there to facilitate the egress of whatever secretions may accumulate beneath it, as well as to permit the vapour of the naphthalin to penetrate to the wound itself. This also serves the purpose of preventing the dressings from adhering upon removal. I then make a roll of absorbent cotton about ½ an inch in diameter, and in length sufficient to enclose the wound and an inch or more of the contiguous parts; this is wrung out of the solution of carbolic acid or chloride of zinc, and disposed as a ring encircling the wound and adjacent surface. Within the space tuhs isolated, I sprinkle the naphthalin in a powdered state to the depth of a quarter of an inch or more, place a dressing of absorbent cotton over it, and apply a muslin roller over all. This dressing is not disturbed until the wound secretions make their appearance through and soil the bandages, or some other indications exist for their removal. In a recent case of Hueter's operation for resection of the head of the first metatarsel bone for hallux valgus, the dressings were first removed at the end of eight days. The parts were in a typically aseptic condition, and only the odour of naphthalin gas pervaded the dressings. In the case of cavities left after operations for the removal of suppurating buboes, necrosed bone, etc., simply packing the cavity in all of its recesses, after thorough disinfection, and applying a dressing of absorbent cotton is found to be sufficient. After operations within the vagina and other natural cavities having outlets, absorbent cotton, in the meshes of which naphthalin has been incorporated, either by saturating it with its ethereal solution and subsequently drying, or simply by rubbing in the powder, may be used. Dressing materials, gauze, etc., may be especially prepared in the same manner as like dressings are prepared containing carbolic acid and iodoform. The method above described possesses the merit of simplicity, however; as to its efficiency, I can bear testimony with great positiveness.

As to the possibility of any dangerous symptoms arising from its free use, I can only say that Lücke and Fischer, of Strasburg, have used it largely, and no disturbances of any kind whatsoever have followed its use. In my clinic at the Bushwick and East Brooklyn Dispensary I have now employed it in a large number of cases, in both young and old, feeble and strong; filling large cavities and applying it unsparingly, I have always met with the best results following its use, and never with a single untoward sequence. I have found it convenient of employment; its odour is not more objectionable than that of carbolic acid, and certainly not as disagreeable to the average nostril, nor as difficult to get rid of as that of iodoform.

* From a report read before the Kings Co. Medical Society. From the 'Proceedings.'

DEODORIZED TINCTURE OF OPIUM.*

BY R. ROTHER.

The most important active ingredients contained within a plant are frequently, if not generally, chemically allied, and are either derivatives of one another or of some common source. The odorous constituents, although generally characterized by extreme potency, become most usually dissipated by reason of their volatility, or if not evaporated, are changed by oxidation into less fugitive, less odorous, and also less active resinous bodies. Therefore, many plants when used in the fresh condition have different degrees of activity and quality than when consumed in a dried or in a prepared state. Modern pharmacy has isolated many of these special agents, and in some instances modified or attempted to modify the raw material in such a manner as to cancel or wholly abolish certain objectionable features.

It was found that opium contained a perturbing body, at one time supposed to be alkaloidal, but now presumed to be of a resinous nature. In order to avoid this substance in certain of its preparations, opium or its aqueous extraction was treated with ether, having in view the removal of this noxious impediment. Such a preparation is the so-called deodorized tincture of opium. The fact has been, however, ascertained that aqueous treatment alone, by excluding the resinous matter, yields a deodorized and otherwise analogous product, showing that the washing of the watery extract with ether is superfluous and wasteful. In order to prevent the possible solution of the resinous matter during the extraction of the opium and incidentally avoid the unnecessary ethereal treatment, but especially circumvent the decidedly objectionable and untimely application of heat needed in the extensive evaporation, the writer changed the operation accordingly. Most volatile oils, resins and semi-resins are soluble in fixed oily menstrua, aside from their various special solvents. Hence, the writer concluded that should there be a tendency in any of the opium resins or odorous principles to pass into aqueous solution, the presence of a fixed oily substance would be likely to prevent it. Vaselin was added to the heated mixture of opium and water, but since the vaselin did not promptly solidify in the cooling mixture, spermaceti was further incorporated with desirable effect. So thorough was the extraction of the activity and exclusion of the malodorous matter, and so admirably were the dregs gathered up by the solidifying fat, that the solution permitted of ready removal by simple decantation. The mixed decantates filtered clear and rapidly, and as no evaporation was necessary the tincture could be completed at once by the admixture of the requisite measure of alcohol. This magnificent result, in connection with the speed and facility of the operation and comparative cheapness of the product, encourages the suggestion to abandon the ordinary tincture of opium altogether. Should it be advisable to retain the narcotine remaining in the dregs, a small proportion of dilute sulphuric acid might be used to secure it in the tincture as soluble narcotium sulphate. From these results the following formula for a deodorized tincture of opium is deduced:

Take of

Opium dried and powdered	.	2½ troy ounces.
Vaselin, Spermaceti (of each)	. . .	1 troy ounce.
Alcohol	. . . . .	7 fluid ounces.
Water sufficient.		

Upon the opium contained in a suitable capsule pour 12 to 14 fluid ounces of water and boil the mixture ten to fifteen minutes; then add the spermaceti and vaselin, stir them well together, let the mixture cool, and decant the liquid from the dregs. Upon the residue pour 8 fluid ounces of water, again heat the mixture, stir it well, and, after cooling, decant as before. Repeat this operation once more with 8 fluid ounces of water or sufficient to make the mixed decantates measure 25 fluid ounces. Mix the three decantates, let the mixture become cold, filter, and finally add the alcohol.

* From the *American Journal of Pharmacy*, February, 1883.

SCHIZOMYCETIC FERMENTATION.*

BY G. MARPMANN.

In this paper the author has collected all the facts known concerning the various kinds of fermentation. Specific bacteria fermentation is that in which, by reason of the growth of bacteria, reduction products are formed, whilst oxidation processes by means of the same agents, such as nitrification, are not fermentation. Nencki explains the reducing action of bacteria by their power of decomposing water, one hydrogen-atom of which reduces, whilst the hydroxyl-group is assimilated by the bacteria.

Glycerol.—Fitz describes three glycerol fermentations: (*a*) in the ethyl alcohol fermentation produced by a slender bacillus, probably identical with *B. subtilis*, in which neither butyric nor succinic acid, nor butyl alcohol is formed; neither can this bacillus decompose calcium lactate; (*b*) butyl alcohol alone is produced by a bacillus 0·005–6 mm. long by 0·002 mm. broad; (*c*) succinic acid is never formed by bacilli from glycerol, but Fitz found in blue pus a small micrococcus, which did act in this way. Schulze has found other bacteria, which besides forming ethyl and butyl alcohols, butyric and caproic acids, also produce a phorone of the composition $C_9H_{14}O$.

Tartaric Acid.—According to Gautier, Mediterranean wines under certain conditions rapidly become thick when exposed to the air; the red colour changes to a blue-violet, and a brown deposit is formed, as also acetic and lactic acids; the cause of this is a bacillus of varying length, but 0·0012 mm. broad. König found succinic acid amongst the products of the fermentation of tartaric acid: hydrogen ammonium tartrate yields butyric acid and ethyl butyrate, under the influence of *Ascococcus Billrothii*.

Sugar.—The mass resembling frog spawn, into which beet-sugar juice is frequently converted, is due, according to Cienkowski and v. Tieghem, to *Ascococcus mesenteroïdes* (0·0018–0·002 mm. thick), whereby sugar is converted into cellulose. The lactic ferment of sugar consists of a thin scum, built up of cells 0·001–3 mm. broad, and nearly double as long. These cells are active only as long as oxygen is present: consequently the conversion is indirect. This ferment, described by Boutroux, does not produce succinic acid, but the acid is formed from grape-sugar by *Bacillus amylobacter*, fully described by v. Tieghem. *B. amylobacter* exists in the cells of all milky-juiced plants; a butyric fermentation of albumin is caused by *B. subtilis*.

Nitrogenous Matter.—Normal urine is decomposed by *Micrococcus ureæ* (0·00125–0·002 mm. broad) with formation of ammonium carbonate; pathological urine is affected by other bacteria. The most important fermentation of albuminous matter is occasioned by *Bacterium Termo* (0·0015–0·002 mm. long), and it is this bacterium which induces the decay of all organic matter, and to which, as preserving the balance between animal and vegetable matter, our thanks are due. All the other schizomycetes are in some way or another harmful to us.

Ptomaines are produced by bacteria as yet undescribed, and the same bacteria also produce phenol, which is remarkable, as phenol is detrimental to their existence; also in decaying matter phenylpropionic and phenylactic acids, indol, cresol and scatol, etc., have been found. Reference is made to various fermentations, and to *Dispora caucasica*, which forms "kephir."

* From *Arch. Pharm.*, [3], xx., 664–673. Reprinted from the *Journal of the Chemical Society*, March, 1883.

The Pharmaceutical Journal.

SATURDAY, APRIL 21, 1883.

Communications for the Editorial department of the Journal, books for review, etc. should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE PHARMACY ACTS AMENDMENT BILL.

IN addition to the various expressions of general approval of the draft Pharmacy Bill that have already been agreed to by local associations, it will be seen from the reports published in this week's Journal that the Manchester Chemists and Druggists' Association and Chemists' Assistants' Association have signified their concurrence with the decision already arrived at in other local centres, with some few suggestions as to particular details. The meeting of the Manchester Association on the occasion referred to does not, indeed, appear to have been very numerously attended, if we may judge from the remark of the chairman, Mr. W. WILKINSON, that he had hoped to have seen a larger attendance in response to the invitation which had been issued to every chemist whose name appears in the Manchester Directory, and to the assistants and apprentices engaged in the trade. This circumstance might be construed as indicating an absence of any desire to object to the suggested provisions of the Bill, and as justifying the inference that they are regarded favourably; but even in that case it would have been desirable that an expression of opinion at so influential a centre as Manchester should have been supported by a greater number of those directly interested in the proposed legislation. There is, however, some reason to fear that a spirit of indifference was the real cause of the small attendance at the meeting, and that on this occasion as well as a former meeting, the men whose business it is to have regard for the interests of pharmacy were "not equal to the occasion," as Mr. WOOLLEY remarked at a late meeting of Council when speaking of the meagre response to the call for a meeting in Manchester, to consider the Pharmacy Bill. We can but express our regret that such should be the case at a time when united and consistent efforts on the part of members of the trade are so much needed.

Passing on to the actual proceedings of the Manchester meeting, the first point referred to is the proposed schedule of "poisonous articles," and though this part of the Bill was not definitely objected to, regret was expressed that it had been thought necessary "to introduce the principle of allowing unregistered persons to sell 'poisonous' articles." These words, quoted from the report of the meeting, put a construction upon the provisions of the second clause of the Bill which is somewhat erroneous and decidedly inconsistent with the fact that unregistered persons being now entitled, as they always have been, to sell the articles in question, no permission is needed for their continuing to do so. It would, indeed, be difficult, from a pharmaceutical point of view, to find any reason for attempting to interfere with established usage in that respect, and as a matter of political economy we should certainly not expect any such reason to be discovered at Manchester.

The real purport of the second clause of the Bill is not to grant permission to sell certain articles, but to regulate the sale of them out of regard for public safety, that being the only consideration upon which such a step can be submitted to the notice of the Legislature. The regret expressed at the Manchester meeting is therefore based upon a misconception of the true nature of the clause in question, no less than upon the erroneous assumption that the particular articles to which the clause would apply are part of the materia medica which appertain exclusively to the practice of the arts of pharmacy and medicine. The unfortunately mixed nature of the business carried on by chemists and druggists is no doubt, to some extent, an explanation of the erroneous opinion conveyed by the above expression of regret at the meeting in Manchester, but it is to be hoped that on reflection it will become evident that it is not by regretting or objecting to a provision for the public good that the trade interests of pharmacy are to be promoted.

Among the other suggestions put forward at the Manchester meeting, three relate to matters of detail, which could well be dealt with satisfactorily in Committee, if the Bill should ever arrive at that stage of maturity, and we therefore refrain from any comment on them. The last suggestion as to the title of Fellow of the Pharmaceutical Society being granted to pharmaceutical chemists who have passed or may pass the Major examination prior to January, 1886, and to those who may after that time pass a higher examination than that provided for in clause 16 of the Bill, is in accord with an opinion that appears to have prevailed at the meeting of the Chemists' Assistants' Association, and is one that merits careful consideration; for while we would deprecate any step tending to increase the present confusion of titles and signs of qualification, and would gladly see the title of "pharmaceutical chemist" made the qualifying title, it must be admitted that there is reason for giving all possible recognition to the voluntary action by which that title has hitherto been acquired.

The papers of Messrs. FRAZER and GILES, dealing with the subject from two diametrically opposite points of view, are in themselves so copious as to render any comment upon them superfluous.

SOLAR PHYSICS.

Eight years have now elapsed since the Royal Commission on Scientific Instruction and the Advancement of Science recommended the establishment by the State of an observatory for solar physics, which led, four years afterwards, to the appointment of a "Solar Physics Committee" and to the first grant of public money being made to be spent in this direction. During this time a growing interest has been manifested in investigations as to the constitution of the sun, and especially those dealing with the phenomena of sun spots and their possible influence upon this planet, concerning which speculation has sometimes run rather wild. A Report just issued shows that the Committee on Solar Physics is now vigorously grappling with the subject, and although the work done by it up to the present time has consisted principally in organization with a view to securing future results, the programme set forth covers a wide area and deals with more subjects than can even be mentioned here. There are, however, one or two passages in the Report to which reference may be made, and especially some "conclusions" of the Committee respecting solar phenomena—based upon the evidence furnished by series of sun pictures—which are, to a great extent, confirmatory of opinions previously expressed.

It appears probable that the varying phenomena of the sun's disc represent the play of a huge system of convection currents, the darker patches, or "spots," being the manifestation of gigantic down currents of comparatively cold matter from above, whilst "faculæ" and "red flames" may denote the corresponding up rush of hot matter from beneath. These convection currents would seem to be always present on the sun's surface, though the scale of the phenomena and the rapidity of the motion are on occasions greatly increased, giving rise then to the complex appearance which is associated with the outbreak of sun-spots. It is thought that it is in virtue of this convection system that a sufficiency of intensely heated matter is brought to the surface of the sun to supply the enormous quantity of radiant energy which it gives out continuously. It would therefore seem to follow that the amount of radiation from the sun's disc would be affected by the relative vigour of this convection system. All observations tend to the demonstration that greater agitation of the sun's atmosphere is coincident with epochs of maximum sun-spot frequency, and the results of some spectroscopic investigations by Mr. Norman Lockyer allow of the conclusion that at such times certain definite levels of the solar atmosphere are heated to a peculiarly high temperature. Further spectroscopic observations are required to clear up this point, but the evidence presented by the sun itself appears on the whole to be in favour of the above inference, and shows that our luminary is really most energetic in its radiation at periods of maximum sun-spot frequency. But it does not follow that this increased radiant energy of the sun always results in an increase of the temperature of the earth; for there are indications that it is also coincident with an increase in the number of great terrestrial atmospheric disturbances, and in some localities with an excessive rainfall, which would tend to lower the temperature. It is evident, however, that should this inequality of the sun's power prove to exercise any definite influence upon the meteorology of the earth, it would become of great importance to be able by the analysis of a sufficiently extensive series of sun-spot records to arrive at a true knowledge of the law of the sun's variability, so as to allow of the state of the sun in any future year being approximately foretold. The collection and collation of such records will therefore form an important branch of the future work of the Committee.

It is well known that Mr. Norman Lockyer has put forward views concerning the nature of the solar atmosphere, based upon his spectroscopic work, which are not in accord with those held by previous observers. Briefly, the ordinary theory is that the atmosphere of the sun is formed by a series of concentric layers of different elementary bodies, passing inwards from hydrogen, through a number of other elements common to the earth, to the "reversing layer" in which are present a large number of metals, and that the spectrum, which in the outer reaches is of extreme simplicity, gradually becomes more complex, because as fresh layers are encountered the outer ones do not die out, but are continued down to the photosphere. Mr. Lockyer, on the other hand, supposes that at the temperature of the sun the chemical elements with which we are acquainted are broken up into finer groups of matter, and that the terrestrial elements, if they exist at all in the sun, only exist in the outer, and therefore colder parts of the sun's atmosphere, from whence the vertical currents of the sun bring down the formed material to be dissociated in the lower reaches, after which, by virtue of its consequent reduced density, it reascends to again become formed material at the appropriate heat level. If the atmosphere were quite tranquil, and the spectrum of a section of it could be examined, Mr. Lockyer believes it would be seen to be divided into an almost innumerable number of layers, each with its appropriate spectrum, not extending very far above or below its normal position, as held in the previous theory, but confined to one heat level, whilst the spectrum would appear simpler as the photosphere was approached from without. The metallic elements, instead of existing as such in a so-called "reversing layer" resting on the photosphere, undergo, as previously stated, entire dissociation there; whilst their germs, becoming distributed throughout the atmosphere, cause the molecular grouping to grow more complex as the distance from the region of greatest heat increases. The appearance, under these conditions, in the spec-

trum of the sun, of FRAUNHOFER lines which are recognized as being characteristic of any particular terestrial element, Mr. LOCKYER explains by supposing that such a spectrum does not result from the vibration of the molecules of the particular element existing as such at any given height in the sun's atmosphere, but results from an integration of the vibration of the "germs" of that element existing, perhaps distributed, from the top of the atmosphere to the bottom. Professor STEWART suggests that if solar phenomena are correctly represented by this hypothesis, the alternate association at high, and dissociation at low levels of solar elementary matter would be expected greatly to increase the intensity of the solar convection currents, and thus the enormously strong currents which observation reveals might find a ready explanation.

With respect to the influence of the state of the sun upon the magnetism of the earth, there can be no doubt that the diurnal range of the earth's magnetism is greatest when there are most sun spots, and that there are at such times an unusually large number of magnetic storms with their accompaniments in the form of earth currents and auroral displays. From the fact, however, that the fluctuations in diurnal ranges, as a rule, lag in point of time behind the solar influences which produce them, it is inferred that they are not produced directly by solar magnetic influences, but indirectly by solar radiation. At present we can only mention that this may find an explanation in a new theory which Professor STOKES has propounded as to the connection between solar activity and auroræ, magnetic disturbances and earth currents, according to which auroral discharges are the immediate excitants of earth currents and magnetic disturbances.

Allusion was recently made in this Journal to the ludicrous position created by the circulation of volunteered reports on the water supplied to the metropolis. The subject was on Monday evening brought before the House of Commons in a question put by Mr. Firth to the President of the Local Government Board, as to whether his attention had been called to the fact that every month reports of London analysts on the character of London water, purporting to be addressed to him, were widely circulated, although not authorized or paid for by his department, but by the water companies, and whether as such a form of report was calculated to mislead the public and to give an appearance of official authenticity not consistent with fact he would either decline to receive any more of such reports or require their form to be altered. Sir Charles Dilke, in reply, said he agreed in thinking that such reports, purporting to be addressed to the President of the Local Government Board, are misleading, and that he should expect that after this expression of opinion they would be discontinued.

In order to grapple with the difficulty experienced in establishing a uniform system of pharmaceutical education in the Australasian colonies, so that the certificates granted by the different local pharmacy boards may become interchangeable, Mr. C. R. Blackett has suggested the holding of a conference in which the pharmacists of these colonies shall be represented. There appears to be considerable probability that the suggestion will be carried out.

* * *

At the date of the latest advices new Bills for the regulation of the practice of pharmacy were before the Parliaments of Queensland and New South Wales, whilst in New Zealand the Pharmacy Board was contemplating attempting some amendment of the Act at present in force in that colony.

* * *

At the recent "commencement" services of the Philadelphia College of Pharmacy, as the result of the examination held at the end of the term 1882–83, the degree of "graduate in pharmacy" was conferred upon 153 persons, including one lady. This was said to represent the largest proportion of passes of the largest graduating class, numbering 160, in the experience of the institution, which has now sent out upwards of two thousand graduates.

* * *

Although not on quite so large a scale, the operations of the New York College of Pharmacy are by no means insignificant, the last session having furnished 63 successful candidates for the degree of "graduate."

* * *

A new edition of the well-known 'Dispensatory of the United States' (Wood and Bache) has just been issued by J. B. Lippincott and Co., of Philadelphia. The work has been revised and to a great extent rewritten, to bring it into accord with the new edition of the United States Pharmacopœia, by Dr. H. C. Wood, Professor J. P. Remington and Professor S. P. Sadtler, and it speaks well for the energy of these gentlemen that although some new rivals have been announced they have been able to bring this standard work of about two thousand pages first into the field. We hope to have an opportunity on a future occasion of noticing the work more in detail.

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Her Majesty has been pleased to confer the honour of knighthood upon Professor F. A. Abel, F.R.S., Dr. Lyon Playfair, F.R.S., and Dr. C. W. Siemens, F.R.S.

* * *

On Monday evening next, Professor Osborne Reynolds, F.R.S., will deliver before the Society of Arts the first of three lectures on "The Transmission of Energy." The lectures will constitute the fourth course of Cantor Lectures for the present session.

* * *

A meeting of the School of Pharmacy Students' Association will be held on Thursday, April 26, at 8 p.m., when a communication will be read on "The Synthesis of Uric Acid," by Mr. T. S. Dymond. Mr. Cripps will read a note on "The United States Pharmacopœia Process for the Estimation of Hydrocyanic Acid," and a "Report upon Pharmacology" will be made by Mr. H. G. Greenish.

Transactions of the Pharmaceutical Society.

NORTH BRITISH BRANCH.

EVENING MEETING.

The last meeting of this session was held in the Society's rooms, 119A, George Street, Edinburgh, on the evening of Wednesday, April 11, at 9 o'clock.

Mr. Alexander Napier, President of the Branch, in the chair.

The minutes of the former meeting were read and confirmed.

The following donations to the Library were then announced:—

Register and Report of the Pharmacy Board of Victoria, 1883.

From the SECRETARY AND REGISTRAR.

Elementa Chemiæ, Hermani Boerhaave. 2 volumes. London, 1732.

From Mr. FRED STEPHENSON, Edinburgh.

Morphology and Physiology of the Cell, recent contributions to our knowledge of. By Patrick Geddes, F.R.S.E. 2 copies. From the AUTHOR.

On the motion of the President a cordial vote of thanks was accorded to the donors.

Mr. Thomas Maben then read a paper on—

THE PREPARATION AND COMPOSITION OF UNGUENTUM HYDRARGYRI NITRATIS.

The paper is printed on p. 857 and gave rise to the following discussion:—

The President, in moving a vote thanks to the author, said that the ointment had always been a troublesome one, but from what had been said by Mr. Maben it appeared possible to prepare an ointment of unvarying composition, provided that certain precautions were taken. He hoped that the members would freely express their opinions on the subject.

Dr. Inglis Clark said that the paper was one of great practical value, the subject having been wrought out in a way which had not been previously done, at least so far as the influence effected by the impurities was concerned. Referring to the impurities, he mentioned that this matter had already been drawn attention to in this Journal, and showed how imperative it is to ensure purity of the oil. Regarding the question as to whether discoloration is due to deficiency or excess of nitric acid, he pointed out that any advantage due to excess of acid and high temperature could also be had by using less acid with a lower temperature, and suggested that in addition to designating the temperature at which the action should take place, the B.P. should also reduce the quantity of acid to about 9½ ounces. The way in which Mr. Maben had explained the formation of mercurous nitrate was exceedingly interesting; it was evident from the insolubility of mercurous salts in ether, that the nitrate was not present in the ointment prepared at a low temperature. Altogether the paper was an able contribution to the literature of the subject, while it commended itself for its thoroughly practical nature.

Mr. Stephenson said that he was struck with the three specimens of ointment prepared from pure oil at different temperatures. That prepared at 300° appeared to be the best. It should not be forgotten, he said, that the Pharmacopœia did practically recognize a temperature in ordering the liquids to be mixed while hot, and if frothing did not take place to apply heat until the mixture did so. Speaking from his own experience he could say that the frothing took place at different temperatures, but the particular frothing which accompanied a well-made article took place, he was sure, at a higher temperature than 212°; probably 300° was nearer the mark. But independent of all this care the ointment did deteriorate, not on the surface, but through the lower layers, so to speak. Regarding the use of oils other than olive oil, he said that he had experimented with fine palm oil, which gave a beautiful ointment, and with trotter and neatsfoot oil, from the former of which he got a good result. The remarks regarding the existence of elaidate of mercury in this ointment were very interesting, and he hoped that it would be determined whether the mercury should be in combination with elaidic acid or nitric acid, or with both.

Mr. Gilmour said that the paper was interesting apart from its relation to citrine ointment; it contained some valuable reference to the effect of an acid solution of mercuric nitrate on oils, and he hoped that the author would continue this portion of his work on the drying as well as the non-drying oils. He had noticed in several experiments in oil-testing that when the oil was at a lower temperature than the acid solution, there was a material difference between the result so got, and that obtained when the temperatures were equal and high. On this point he would like to hear the opinion of the author of the paper.

Dr. Clark, in asking Mr. Maben if he had any experience of the use of vaseline in the preparation of the ointment, said that of late several medical men had prescribed such an ointment, and as it had been stated that it is very satisfactory and permanent, pharmacists had to do their best to produce a good-looking article. It had already been pointed out that an ointment made with vaseline could not have a similar composition (so far as mercury salts were concerned) to the Pharmacopœial preparation, but he might say that the ingredients did not even form a homogeneous mixture, also having the objectionable property of great acidity. Again referring to the question of temperature, he remarked that it was only necessary to melt the lard in the oil by means of a water-bath, and using 9½ ozs. of nitric acid to add the mercury solution cold, when abundant frothing took place during five or six minutes, the result being a very satisfactory ointment.

Mr. Stephenson said that he could speak of the use of vaseline from experience. He got a nice smooth, though high coloured cintment by using it, but on standing a few weeks he was surprised on going to it one day to find that its bulk had increased very much, the lid of the pot being forced up. He had no hesitation whatever in saying that the proposal was thoroughly unworkable.

Dr. Stevenson Macadam, on the invitation of the President, said that he was afraid he could not throw much light on the subject, having come in late and lost the more important points of the paper; but he wished to express his gratification at finding an old pupil continuing his studies in so practical a manner.

Mr. Maben, in thanking the meeting for the manner in which his communication had been received, said that he had seen the letter to which Dr. Clark had referred, the writer of which expected an ointment made with adulterated oil to be of an orange colour; this was a natural assumption, but experiment showed that the colour would be blue or green, according to the extent of the adulteration. Regarding the excess of acid, he would only repeat his opinion, that an excess was required to decompose olein into elaidin, and further that a high temperature is better than a lower for effecting the whole series of decompositions taking place in a well-made ointment. In reply to Mr. Gilmour, he said that he maintained the temperature until all action ceased. He had experimented with all the known adulterations of olive oil, and being still engaged in the work he would take advantage of the hint thrown out. Mr. Stephenson's experience of the use of vaseline so well refuted the statements of its suitability that he required to add nothing to what he had said. The suggestion was quite an unscientific one.

Mr. Patrick Geddes, F.R.S.E., then delivered a lecture on the "History and Present State of the Cell Theory," and the President of the Branch closed the session by a few valedictory remarks. The lecture and other business will be reported next week.

Provincial Transactions.

GLASGOW CHEMISTS AND DRUGGISTS' ASSOCIATION.

THE PROPOSED CHANGES IN THE PHARMACY ACT OF 1868, AND IN THE EDUCATIONAL SYSTEM OF THE PHARMACEUTICAL SOCIETY, TOGETHER WITH SOME REMARKS ON THE PRESENT POSITION OF PHARMACY.

BY DANIEL FRAZER.

(*Concluded from page* 850.)

Having thus gone over the contents of the Bill, as well as noticed the omissions just discussed, I would like, with your permission, before proceeding to sum up and give my judgment on the case before you, to make some remarks on the present educational proposals of the London Council.

The report of the Committee on the Relation between Pharmaceutical Education and the Pharmaceutical Examinations was discussed and generally adopted by the Council exactly a year ago (see Journal of April 15, 1882). The report then carried was remitted to the original Committee to put into a practical form. The resulting report was laid before our Council on March 7, last, and adopted, after considerable discussion. I will now notice some of the more important innovations or novelties embraced in these reports, and leave you very much to form your own conclusions as to their practicability.

The most important of these is the sought-for establishment of a curriculum. This is to consist of sixty lectures in Chemistry and twenty on Physics relating to it—eighty in all, forty-eight lectures on Botany and forty lectures on Materia Medica; each of these lectures must occupy at least one hour in delivery. In addition to the lectures there is to be a three months' attendance at Practical Chemistry of not less than five hours a day. Some of the things embraced in this curriculum are such as these:—The Laws of Gravitation—Cohesion—Adhesion—Elasticity—Molecular Attraction—Comparative Hardness of Bodies—Physical Condition of Gases—Mariotte's Law—Light: its Nature—Polarized Light—The Spectroscope and its Uses—the Making of Barometers and Thermometers, etc. The time over which the curriculum is to extend—

Ten months	Two hours daily.
Five months	Three hours daily.
or	
Three months	Five hours daily.

All the recommendations embraced in both reports are, when finally adopted, to be "incorporated into the bye-laws, according to existing regulations, and to come into force on and after December 31, 1887."

In addition to the innovation of the curriculum itself there is the one already referred to in the first part of this lecture—the one rendering it necessary that the student attend in open shop for three years *after* registration before he can go up for the *first portion* of the qualifying examination. There is also this further innovation—*one year* at least must elapse between the passing of the *first part* of the qualifying examination and the date at which the candidate can enter for the second part of it.

All that I will add here is that in both the discussions that took place in the Council when these reports were submitted to it Messrs. Williams and Hampson maintained that the powers sought in respect to the age of the candidate, and to the breaking up of the examination into two parts, are illegal, and beyond the powers of the Council. On this point Mr. Williams is reported to have said:—"Probably certain clauses had been put into the new draft Bill which had been submitted for the approval of the Council at their last meeting with the view of enabling the Council to alter the examinations in the way indicated, but at present he was quite clear the Council had no legal power to do so; and so on that ground alone he should feel bound to vote against these recommendations."*

Mr. Hampson is reported to have said that "he believed the Act of Parliament had been unduly stretched already in imposing the condition that a candidate should be twenty-one, which was distinctly illegal, in his opinion;† and the division of the examination into two parts, as now proposed, he believed was utterly beyond the powers the Society now possessed."

I will not insult you by offering a single argument in vindication of my own, and, I hope, your condemnation of the curriculum and all its belongings.‡ But I do add this, my intense regret that Messrs. Hampson and Williams, in their opposition to even a portion of the recommendations—that of dividing the examinations into two portions—had not the support of our much respected representatives, Messrs. Young and Borland.

In connection with the proposed changes in our educational arrangements, I here seek your indulgence for a very few minutes while I attempt to give a brief summary of proposals on the subject, emanating from a gentleman outside the Council and even of the Society itself, but who is of much, and most deserved, influence with most, if not all, its members. These proposals reached the members of Council in the form of a printed letter in the autumn of 1881—after the withdrawal of the proposed Pharmacy Bill of that year. This letter has not been published, and may, so far as my knowledge is concerned, have since then been withdrawn or been superseded by a later and a quite different one.

The following are some of the recommendations contained in the letter:—

Preliminary Examination.—"This examination should be increased in scope and stringency. The following should be added to the present subjects of examination:—Algebra, Euclid, and French or German."

Minor Examination.—This is to qualify for "assistants" only, and the *Minor* shall not be permitted to be registered as a chemist and druggist as heretofore, nor to "commence business on his own account."

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* Mr. Williams, in the debate on the educational proposals in April last year, is reported to have said that he "need not say that the examinations to be carried out under the scheme proposed would be of a totally different character to that ever contemplated by Parliament when the Pharmacy Act was passed. Mr. Schacht might say it was only one examination, but he contended it was distinctly three, and he could not mould three into one. He was quite sure it was never contemplated by Parliament when the Pharmacy Act was passed. They had already stretched the Act a long way when they made the original alteration of introducing the Preliminary examination and insisting that there should be three years between that and the Minor."

† Better late than never. When this restriction on the age of the candidate was proposed, my own hand was the only one held up against it. Mr. Mackay offered to second my motion if I would have accepted twenty years as the age, instead of putting no restrictions at all, as I wished. I have no access at present to a report of this meeting, but feel sure that the facts are as stated. If wrong I will be most happy to be put right.

‡ The Home Secretary and the Postmaster General are lecturers or professors in Cambridge. Does anybody know how many students attend their lectures, or, for that matter, anybody else's lectures there? There are lectures in the Middle Temple. How many who pass their examinations and become full-fledged barristers attend a single lecture there or elsewhere? Is it not the fact, that in the great majority of cases in Cambridge the whole work is done by a series of examinations? Is it not the case, that a man may, and sometimes does, pass all the examinations of the Temple, not only without attending any law lectures anywhere, but without being necessarily once in a law office or court? If it be so in these cases, how can the necessity of a curriculum for the pharmacist be vindicated before the Privy Council?

Major Examination.—Some knowledge of microscopy to be added to it.

Fees.

	£	s.	d.
Preliminary	3	3	0
Minor, as above	6	6	0
Major	6	6	0
Total Examination Fees . .	15	15	0
Life Membership Ticket .	5	5	0
(Or Annual Subscription, £1 1s.)			
	21	0	0

"'Assistants'—that is persons who have only passed the Minor examinations—should not be permitted to carry on business on their own account or to manage a branch business, or the business of a deceased registered person for executors, etc."*

The close of the paragraph from which I have just quoted is as follows:—"The names of 'pharmaceutical chemists only' should therefore be published in the official register of persons entitled to carry on business, except those chemists and druggists already on the register."

The writer of the letter further suggested as a possibility, but does not recommend it, that in case the existing Minors might complain of the proposed change, "they might be permitted to qualify as pharmaceutical chemists by passing a somewhat modified examination, provided that was passed within a certain time—say one year."

As I think I can safely leave you to form your own conclusions as to the recommendations just quoted, I do not add what mine are, but leave them to be guessed at; and I do so with full confidence that all here at least will guess aright.

I wonder whether some of you are thinking of Cowlairs and Queen Street Stations, and of the rope that unites the two? It cannot surprise me though you were so thinking, for my yarn on the Pharmacy Acts Amendment Bill has been so spun out that even I, myself, had begun to think that it might turn out to be as endless as that often-circling but never-ending rope. But the longest lane has always a turning, and my story will have an ending. The only difficulty I now feel is, which of the many strands of my wearisome yarn should first be dealt with. As "the safety of the public" is the ground on which the present demand for further legislation in pharmaceutical matters is demanded, it had better come first in our review.

On this point, then, I demur to the assertion that the "public safety" calls for such further legislation as our Council is now seeking. I do not think it does, and I ask what evidence can be produced that it does? Have the public demanded it? Has the press advocated it? Certainly not. The Veterinary College at Lincoln, an ill-informed coroner here and there at long intervals, and an excitable doctor whose patients ventured to doctor themselves rather than trust him with their case, neither singly or unitedly, form "the public" for whom laws are passed by Parliament. Is there a particle of evidence to prove that the "safety of the public" has been jeopardized through the defective education of the existing pharmacists of the country? I unhesitatingly say no. And if this be so with us—thirteen or fourteen pharmacists of all ranks—how is it with the non-pharmacists who have invaded our territory? Has our most able law-adviser, Mr. Flux, has the indomitable Mr. Barclay, with all the lynx-eyedness of himself and of Mr. Haydon, been able to bring before the country any evidence of the abuse of the trust awarded by law to the stores for the selling of "poisons" and the dispensing of "medical prescriptions?" I answer:—I believe that no such evidence is producible. We may, therefore, dismiss the plea of the "safety of the public" as calling for this Bill.

"Protection of Trade" may probably be thought by many of you a fitting theme to be here dealt with. There is no theme so popular with the letter-writers in the Journal of the Society. When anything goes wrong—when the inevitable corn is trod upon, or when the pharmaceutic shoe pinches anywhere, up goes a letter to the Journal or to the *Chemist and Druggist* asking why the Council takes no steps to protect the interests of the afflicted letter-writers.

For a very simple reason. The Council are helpless in most of the cases for which their support is invoked. The Council can only step into the breach when the law has been invaded. So it is with Parliament. Parliament will only step in in the interest of the public, and not in that of the pharmacist. If there is any conflict at any time between these two interests, that of the pharmacist will undoubtedly go to the wall and that of the public will be cared for.

What led to the enactment of the Irish Act of 1875? Let it speak for itself:—"And whereas, a great deficiency exists throughout Ireland of establishments and shops for the sale of medicines and compounding of prescriptions, and great inconvenience thereby arises to the public in many parts of the country," etc.

How did this deficiency in the supply of shops and establishments for the supply of medicines and the making-up of prescriptions arise? Through the over-education and the over-protection of Irish apothecaries. The education to qualify for passing was so high and so expensive that few entered the ranks, and there were whole districts and villages without apothecaries. Coupled with this was the strict protection to the apothecaries in the compounding of "medical prescriptions." There were druggists in abundance everywhere, but none of them had this privilege; and hence the "great inconvenience" to which the public were subjected, and which led to the passing of the Irish Act.

"Like causes produce like results."

It is to a like restriction in this country that the present policy of our Council is directly tending. I strongly oppose the increasing of the stringency of the present examinations and the increased cost of them, on two grounds. First. Because I believe they are high enough already. I again insist upon it that no case has been made out for an increase in the character or the cost of the examinations. Second. I oppose the increase because of its inevitably thinning our ranks—that thinning that has begun to attract the attention of those of our number who ever give such matters even a passing thought. That this thinning process will go on as a sequence to the passing of the present Bill—if it ever be carried—is not denied by even our officials. The Vice-President of the Council, Mr. Atkins, at a late dinner of the London assistants, and where Mr. Carteighe presided, is reported to have said that "he was glad to address young men—the assistants of to-day but the pharmacists of to-morrow. He envied them their age. He thought that whatever might be the changes of the future there were fair days in store for them. Their numbers might be reduced, but there would be a more elevated few possessing a higher degree of culture."

Yes, the "upper ten" of our ranks perchance may become the "upper five." Such a policy may profit the wealthier houses, but it will assuredly injure their less fortunate brethern. I do not say that this is the aim of the promoters of the measure under discussion, but I most unhesitatingly affirm that this will be the result. The toilers and moilers—the rank and file of the Society—unable to procure apprentices or assistants to carry on their business, will be left out in "the race for riches;" and they going to the wall, the "upper ten" or the "upper five," as the case may be, will get one portion of their lost trade, and the store and the grocer will get the balance!

* The etcetera here means the widow and orphan children of the deceased!!

The Government, warned by the effect of the restrictive principle in operation in Ireland before the passing of their Pharmacy Act, will take care that no such restriction shall be allowed in this country.

The London *Times* (February 14, 1881), writing on the then proposed Medical Amendment Act, wrote:—

"The Bill of Mr. Hardcastle is one which no British Parliament could ever sanction. Under the disguise of providing for *medical education*, it is a measure of scarcely veiled trades unionism," etc.

Were our Amendment Bill to reach the stage which Mr. Hardcastle's did, could the *Times* more accurately or concisely describe it than by applying this very language towards it? Especially applicable would this description of it be were it applied in connection with the educational proposals of the Council. And if so applied to it, how long could you expect it to survive the castigation? Rather than run such a risk, better even yet, I say, withdraw the Bill; and instead of acting on the educational resolutions so lately adopted, pass one to reduce the Preliminary fee to £1 1*s*., and to make the Minor the only pass examination needed to qualify as "pharmaceutical chemists."

Soberly and seriously I mean all this, and had our Councillors but the faith to try the experiment, sure I am they would ere long see a more contented and better-to-do constituency than they can hope to see under the "spotless ideal" scheme of education that Mr. Schacht considers so "exactly correct."

Though last, not least, the stores must not be overlooked in my summing up. I have already so largely referred to them that what I add here need not detain us long. We cannot close them; we must rest content with their existing side by side with us. Is their existence an unmixed evil after all? I think not. The underlying principle on which they are conducted, and which has led to their success as trading companies, is the "ready cash" one; no credit given, no day-books kept. This may lead to a large measure of reform in this matter with others, and if so, we may share the common good derived by others through the operation of the principle of ready cash, small profits and quick returns. When an omnibus proprietor wishes to run an opponent's 'bus off the line he runs one of his own right in front of it and one behind. Well, you find that the stores are underselling you in proprietary and other articles. They are selling our specialties at rates that can yield them such bare returns for the capital invested, that I do not despair of their giving up very large portions of it. Meanwhile they are making rich by having remunerative prices for the staple articles of their trade. You add some of these to your business and undersell the stores in them. Do not attempt to compete with them in selling your own standard articles at prices under those of their own makers, because if you do you will gain nothing by it. On such a topic, the just remuneration of us pharmacists, ponder well the wise words of the old Glasgow citizen and professor, Adam Smith.*

* "Apothecaries' profit is become a bye-word, denoting something uncommonly extravagant. This great apparent profit, however, is frequently no more than the reasonable wages of labour. The skill of an apothecary is a much nicer and more delicate matter than that of any artificer whatever; and the trust which is reposed in him is of much greater importance. He is the physician of the poor in all cases, and of the rich when the distress or danger is not very great. His reward, therefore, ought to be suitable to his skill and his trust, and it arises generally from the price at which he sells his drugs. But the whole drugs which the best employed apothecary, in a large market town, will sell in a year, may not perhaps cost him about £30 or £40. Though he should sell them, therefore, for £300 or £400, or at a 1000 per cent. profit, this may frequently be no more than the reasonable wages of his labour charged, in the only way in which he can charge them, upon the price of his drugs. The greater part of the apparent profit is real wages disguised in the garb of profit."—'Wealth of Nations,' book 1, cap. 10.

Every dog has its day, and the stores are having their days of prosperity just now; but days of adversity are sure to come to them, as they do to all some time or other. Very many of the stores started under most favourable auspices have had to close their doors, and be sure, there are "more to follow." But do believe this—they will not be put down through any action of Parliament. So do not invoke its aid for such a purpose until you can prove that by shutting the stores and drug-dealing grocers up you will thereby be acting in the interests of the public, and not in your own merely. I have one more morsel of comfort to give you on this subject. Stores are not new—they have been born and they have died in the past, as they will doubtless do in the future. Here is the advertisement of one of these, exactly as it appeared in the columns of the *Glasgow Mercury*, of December 1, 1789:—

JOHN SWANSTON,

At his Shop a little West from the Candleriggs,

BEGS leave to acquaint his Friends and the Public, that he has just now imported, from the first markets in Britain, a complete Assortment of the following Articles, which he is selling, WHOLESALE and RETAIL, at very moderate prices, for ready money.

A parcel of fine Bohea, Congou, Souchong, Hyson, Gunpowder TEAS, in the original packages, from the Indiahouse.

Lemons, China Oranges, Wine Grapes, St. Katharine's Prunes, Turkey Figs, Jar and Muscatel Raisins, Currants, Almonds, Pistachia Nuts, Cashue Nuts, and Walnuts——Fine ENGLISH SUGARS, best Raw and Powder Sugars——Refined Liquorice in small boxes.——Patent Cocoa, Cocoa Shells, Churchman's Patent——Chocolate, Best Raw and Ground Coffee.—Red and White Port, Lisbon, and Sherry WINES—Florence Oil—Best French and English Vinegars—Pickled Mushrooms, Walnuts, Capers, Cucumbers, and French Beans; India Soy, Mushroom Ketchup, French Olives, Anchovies.—SPICERIES of all kinds.—Truffels and Morrels, Best Mustard, Hartshorn Shavings, Maccaronie, Vermicelli, Rice whole and ground, French Barley, Saloop, Sago, Millet, Isinglass, Basket Salt—Best French and Poland Starch, Blues of all kinds—Best Wax and Sparmaceti Candles, all sizes, Green and White Wax Tapers, Mogul Cards; Spanish Door Mats; Punch Ladles and Strainers.

Bailie's Patent Blacking Cakes, BING's and WALKER's Blacking Balls—A neat assortment of GLASSWARE—CONFECTIONERY of all kinds, Citron, Orange, and Lemon Peel, Red and Black Current Jellies, Marmalade, and Virgin Honey.—Oliphant's Powder and Pomatum, Lavender and Hungary Water, Essence of Peppermint, WARREN's Milk of Roses, STOUGHTON's Elixir, Pectoral Lozenges of Tolou, Hemmit and Ruspini's Tincture and Dentifrice, GREENHOUGH's Tincture for the Teeth and Toothache, Dragon Roots and Teeth Brushes, White Almond and Cream Wash Balls, Italian and Windsor Soap, Almond Powder, Essential Salt of Lemons, Best Swan-down Puffs, &c., &c.——Best New KENTISH HOPS.

A few GOLDEN PIPPINS and NONPAREIL APPLES.

From the frequency with which his advertisements, even in those early days, appeared, it must be supposed that John Swanston did a roaring trade in his day—but, alas! his name and his fame have long, long since disappeared from the roll of Glasgow citizens. Not so with another early, but only a rarely advertising firm—and one that, unlike our hero of the ancient store, did not proclaim themselves as "selling at very moderate prices for ready money only."

John Swanston and his successors, if he had any, are all unknown to fame now; not so with the other firm—the M'Aslan and Austin of 1789, are now flourishing more than ever, though under the more euphonious title of Austin and M'Aslan! Surely there is a moral not to be easily cast aside in this?

That Mr. Swanston was not the sole poacher on the supposed sacred territory of the chemist and druggist of his times, the following extracts from *The Glasgow Mercury* at the respective dates quoted, amply prove:—

(*From* "GLASGOW MERCURY" *of Wednesday, February* 13, 1788.)

J. WHITELAW,
HAIR-DRESSER AND PERFUMER,
At his shops, No. 36, opposite the Old Guard, Trongate, and No. 184, opposite Bell's Wynd, High Street,
GLASGOW;
Where the PUBLIC may be supplied, on the most reasonable terms, with the following articles, viz.

. . . . . The Essential Salt of Lemons, for taking ink spots or iron-moulds out of linen, lawns, cambric, &c. Each box, 1 s.—Refined Liquorice, for Coughs and Colds.—Milk of Roses, Tooth Powders and Brushes.—The very best Blacking Balls and Cakes, for Boots, Shoes, &c. at 1 s. or 6 d. each.

(*From* "GLASGOW MERCURY" *of Tuesday, April* 28, 1789.)

MR SPILBURY'S DROPS.

. . . . . .

N. B. Mr Spilbury's Drops are vended in bottles of 5 s. and 1 l. 2 s. Also his Treatise on the Scurvy, Gout, Diet, &c., fourth edition, price 2 s. with a hundred cures relative to those disorders, and other irritating painful maladies arising from impurities of the blood, &c.—Sold by James Duncan, bookseller, Trongate, Glasgow: P. M'Arthur, bookseller, Paisley; William Muir, Kilmarnock; Mr. Boyd, Dumfries; and by the general vendors of medicines in Great Britain and Ireland.

(*From* "GLASGOW MERCURY" *of Tuesday, July* 8, 1794.)

Just received,
By Messrs. DUNCAN and CHAPMAN.*
Trongate, Glasgow.
A FRESH SUPPLY OF THE
CHEVALIER RUSPINI's STYPTIC.

. . . . . .

The Chevalier has every week instances of its wonderful effects.

Where also may be had,
Ruspini's DENTIFRICE POWDER for keeping the Teeth and Gums in a state of beauty and purity, 6s. per box, duty included.
——— TINCTURE for do. 6s. per bottle, duty included.
——— ELIXIR for the cure of the Toothache, 6s. per bottle, duty included.
——— BALSAMIC STYPTIC for curing internal and external Bleedings, 8s. 6d. per bottle, duty included.

(*From* GLASGOW MERCURY" *of Tuesday, July* 8, 1794.)

A CERTAIN CURE FOR CORNS.
INFALLIBLE
GERMAN CORN PLAISTER.

. . . . . .

This is the celebrated Plaister that gained so much reputation in Germany; and has been sold in London upwards of 50 years with the greatest reputation.
Price 1s. 1½d. the box, duty included.
Sold in London wholesale and retail by T. Axtell, Bookseller, No. 1, Finch-lane, near the Royal Exchange, Cornhill. Also, by appointment of the Proprietor, by Mr. Baxter, South Bridge, Edinburgh; and by ANGUS M'DONALD, jeweller, Glasgow.

You see by these extracts that proprietary articles were, in those olden times, sold by almost everybody but druggists; and so, after all, perhaps it is the corresponding traders of our day that have to complain of us invading their territory, and not we of them invading ours!

It may now very properly be asked what is to be the upshot of all this commotion, what the fruit of all these boilings up in the pharmaceutical caldron into which we have so long been looking to-night? For years the uneasy heads, that wear not crowns, of pharmacy, "troubled with thick-coming fancies" of dire disaster to our calling, through the competition of the stores with it on the one hand, and with dreams of crowds of entrants to our ranks through "cram" on the other, have at last entered the field of Parliamentary warfare with sword unsheathed and flag unfurled, to do battle with both their dreaded foes.

Through their Pharmacy Acts Amendment Bill the Council hope to deal a death-blow to the first, and to all such; and through their educational resolutions, they count upon obtaining an easy victory over the last. If they do succeed in getting all the powers they are now seeking, then the doom of the stores has come, and the days of "cram" are over, and a right merry dance of exulting professors, and of jubilant councillors, in the halls of 17, Bloomsbury Square would speedily ensue to gladden the heart, and cheer the spirits of the most worthy of all Secretaries and the most faithful of all Registrars.

But if they do not succeed—if Parliament should refuse to pass the Act, and the Privy Council withholds its sanction from the Resolutions—what then? It may be difficult even to surmise what Parliament may positively do, but I do not think that there can be any difficulty in settling beforehand two things, at least, that it will not do. It will not legislate for our interest, at the sacrifice of that of the public; and it will not give our Society powers to override those of the Privy Council itself.

Not till it pass an analogous Act regarding its own powers—the transference of its powers of administering existing laws and of enacting new ones, to the Cabinet, even with a Gladstone or a Salisbury at its head,—will Parliament grant our Council the powers sought in their Act and their Resolutions.

But what is very likely to happen is this: Our "glory" will be preserved or perhaps enhanced, but it will be done at the expense of our purse. All our existing titles, and more if we ask them, will be sacredly preserved to us, but our trade will be divided. None but entrants through the portals of Bloomsbury Square will be allowed to emblazon over their doorways any one of all our legally-sanctioned titles; but "licensed to sell poisons and poisonous articles" will most likely be seen written in more sombre colours over the humble doorway of the grocer and the general dealer. That is what I expect—the extension of the principle of clause 2, expanded to embrace all the poisons of schedules 1 and 2. Not only so, but I think it not improbable that the Chancellor of the Exchequer will seek to couple this new licence with the old one of patent medicines, and double the amount for the double privilege, thus at once "dishing" the existing monopoly in "poisons," the wished-for monopoly in patents containing poisons, and greatly enhancing the revenue of the country. My reasons for thus thinking that some such results as these may follow from our rushing into Parliament are abundantly simple.

1st. "The safety of the public." That has been so much cried about by our Council and the Trade Association, as well as by odd men here and there at intervals, that the Government imagine they must do something. That something need not be much. Possibly it may be thought by them that the "public safety" will be sufficiently conserved by their establishing over the country numbers of such licensed premises as I have named, and enforcing the labelling *as poisons*, or *as poisonous*, of all restricted articles. This would be sufficiently secured by the infliction of a heavy penalty for its infraction, or by liability to have the licence withdrawn for the second or third offence. Even less than this may be deemed adequate protection of the public. The labelling only, as provided for in clause 2 of the projected Act, may be all the security the Government shall deem necessary.

2nd. Warned by the evils that arose from the restriction of drug establishments where the public in Ireland could have their prescriptions dispensed, and which called for the passing of the Act of 1875 to remedy the evil, the Government will take care not to sanction such fresh legislation as would lead to a similar inconvenience and evil to the public of this country. That the convenience of the public as well as their safety will be most jealously guarded by Parliament may well be deemed certain, when we remember the action the Privy Council took when it refused, at the request of our Council, to add the mineral acids to either of the existing poison schedules. And that

* Printers and Publishers of *The Glasgow Mercury*, etc.

the sought for legislation and the accompanying changes in our educational system would tend directly to the reduction of the number of pharmacists and of "shops for the sale of medicines and compounding of prescriptions" throughout this country, as did similar legislation in Ireland, is not only asserted, as we have already seen, by the Government Inspector of Examinations, but is even allowed, as we have also seen, by the Vice-President of our own Council—Mr. Atkins.

And now with a word of warning I am done. If on consideration of the facts and arguments I have at such unpardonable length placed before you, you should come to think with me that the continued protection of our titles may be the only shred of protection left to us at the close of the struggle that our Council backed up by that of the Trade Association have entered upon with the stores, then "Be strong and quit yourselves like men," be up and doing, and on the twenty-third day of May next let your voice be heard in Bloomsbury Square—not for war, but for "peace, retrenchment, and reform"—that is, withdraw the Bill, cast out the resolutions, and rest and be thankful with such protection and privileges as ye now enjoy.

If you and others nearer the centre of influence do this, and you succeed, then I will not despair of seeing brighter days for the pharmacist than he has seen of late, and that too without loss to that ideal "pharmacy" for which not a few of our men of science and men of "culture," appear willing to sacrifice its bone and sinew.

The tide has of late been running against you—but patience, brother! and it will turn, as all tides have turned for willing and patient workers, and the waters will yet swell up to the brim, and the pharmacists of the future will float at least as prosperously on their breast as ever their predecessors did.

LIVERPOOL CHEMISTS' ASSOCIATION.

The twelfth general meeting of the above Association was held at the Royal Institution, on Thursday, March 29, 1883, the President, Mr. Councillor Woodcock, in the chair.

The minutes of the previous meeting were confirmed, and the following donations announced:—The *Pharmaceutical Journal*, from the Society, and the 'Annual Report of the Law Students' Association,' from the Association.

Mr. Michael Conroy, F.C.S., read a communication upon—

Insect Powder and Insect Flowers.

BY M. CONROY, F.C.S.

Probably most of the insect powder sold in this country is that ground here from closed Dalmatian flowers (*Pyrethrum cinerariæfolium*); but there is also a large quantity of the foreign ground powder imported, which, owing to its brighter yellow colour is preferred by many, and consequently finds a ready market. The imported flowers, are commercially known as "closed," "half open," and "open," the first consisting of unexpanded flowers, while the two latter kinds consist of the expanded flowers, many of which are deficient in, or have entirely lost the active florets, and are consequently of much less value than the closed flowers as an insecticide. There is still a further distinction caused by the popularity and increased demand for this powder, the result being that the flowers are now specially cultivated, so that now both wild and cultivated varieties are offered. The wild kind, however, is the most esteemed, and fetches a higher price owing to it being much more energetic in its action. The imported powder arrives here chiefly in kegs and tins, and most of it is of a bright yellow colour, such as English grinders find it impossible by any legitimate means to match. Some foreign dealers, more honest than others, euphemistically call this "dyed insect powder," while others term it "yellow closed," but as many prefer this article to the duller coloured English ground powder, it cannot be generally known that this bright coloured foreign powder is largely adulterated with yellow colouring substances. It has already been shown that it is frequently dyed or rather adulterated with chrome yellow, though personally I have never found it in any sample; but the samples on the table, which are of a very rich colour, are largely adulterated with fustic, and are being now offered at a price at least 10*s.* below what is now paid for the unground flowers. This fraud has been practised for some time past, and though a strong advocate of free trade principles, I would recommend dealers in this article to avoid the foreign powder until, at least, it is sent here in a genuine state.

Mr. Conroy then exhibited samples of the various kinds of flowers and powders as imported.

A vote of thanks was passed to Mr. Conroy for bringing this communication forward.

Mr. Charles Symes, Ph.D., then read a paper entitled "Some Facts concerning Filtration."

The paper will be printed in a future number.

A lengthy discussion, in which Messrs. Davies, Conroy, Mason, T. F. Abraham and A. C. Abraham took part, followed the reading of this paper, and a vote of thanks was passed to the author, who replied to some of the criticisms, and thanked the members present for their attention to his remarks.

MANCHESTER CHEMISTS AND DRUGGISTS' ASSOCIATION.

A meeting of members of the above Association and other registered chemists, was held at the Memorial Hall, Albert Square, on Friday evening, April 13. Mr. W. Wilkinson, Vice-President of the Association, occupied the chair, and in the course of some introductory remarks referred to the fact that at the last ordinary meeting of the Association the proposed Pharmacy Act Amendment Bill had been thoroughly discussed by the members present, but it was thought desirable to give every registered chemist in the city and suburbs an opportunity of expressing his views on the proposed enactment before forwarding resolutions to the Council of the Pharmaceutical Society. With this object in view every chemist whose name appeared in the 'Manchester Directory' had been invited on the present occasion, and, further, it had been intimated to each, that all engaged in the trade as assistants or apprentices would be cordially welcomed. Under these circumstances, he hoped to have seen a larger attendance.

The proposed Act was then read, clause by clause, and fully discussed, and the following resolution was proposed by the Chairman, seconded by Mr. Jackson, and carried unanimously:—

"That this meeting of members of the Manchester Chemists and Druggists' Association and other registered chemists and druggists of Manchester and district, having considered the Draft Pharmacy Act Amendment Bill, proposed by the Council of the Pharmaceutical Society, hereby expresses its approval of the same if amended in accordance with the following suggestions:—

"It regrets that it has been thought necessary to introduce the principle of allowing unregistered persons to sell poisonous articles.

"In clause 4 it should be more distinctly expressed that the bottle or other vessel containing the poison should itself, as well as the outer wrapper, bear the word 'poison' with the name and address of the seller.

"If in clause 5 it be a 'second offence' to sell a different patent medicine containing poison unlabelled, this clause requires amendment.

"In clause 6 the word 'and' should be substituted for 'or' in line 4.

"Pharmaceutical chemists who have already or shall have passed the Major examination prior to January, 1886, to have the title of Fellow of the Pharmaceutical Society. This title to be also conferred upon all who

shall subsequently pass a higher examination than that provided for in clause 16 of the Act."

The Secretary was requested to forward a copy of the above resolution and suggestions to the Council of the Pharmaceutical Society.

A paper by Mr. Alfred H. Jackson, B.Sc., on "The Educational Value of Pharmaceutical Studies," had been announced, but in consequence of the lateness of the hour the reading of this paper was postponed till a future meeting.

EDINBURGH CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

The eleventh meeting of the session was held on Wednesday, March 28, in the rooms of the North British Branch. Mr. P. Boa, President, in the chair.

The minutes of last meeting having been read and confirmed the Chairman called upon Mr. W. Aitken to read a paper on—

Photography—Dry Plate Process.

The author, in opening the subject, briefly referred to "light," with regard to photography generally, after which he explained what was meant by the "dry process" of to-day, as the coating of glass plates with an emulsion containing the sensitive salts in the form of the bromide, iodide and chloride of silver. He also considered the properties and peculiarities of gelatine, and noticed the photographtive properties of bromide of silver, drawing attention to the various conditions under which a slow or a rapid emulsion may be formed. He then explained the camera and the conditions necessary for making the exposure, and described the process of development by the pyrogallic and ferrous oxalate methods, giving the reactions which occurred, and afterwards briefly described the manner of procuring the prints. An interesting collection of pictures was exhibited, comprising a series of photos of the finish of the Derby, views of Niagara Falls, several transparencies, as well as some amateur work, apparatus, etc.

An interval of ten minutes after the reading of the paper gave the members an opportunity of examining the specimens, and thereafter, on the motion of Mr. McEwan, a hearty vote of thanks was awarded to Mr. Aitken.

The discussion which followed was taken part in by Messrs. Boa, Crowden, Henry and Turnbull, and a vote of thanks was accorded to Messrs. J. D. Robertson and McEwan for the loan of some fine specimens of photographic art. Some formal business having been disposed of and the Chairman having intimated that the Annual Business Meeting would be held on Thursday, April 12, the meeting was closed.

Proceedings of Scientific Societies.

CHEMISTS' ASSISTANTS' ASSOCIATION.

Pharmaceutical Politics.

BY R. W. GILES.

(*Concluded from page* 855.)

The conduct of the Bill through Parliament exercised all Mr. Bell's tact to reconcile the crotchets of critics of all shades of opinion, from the friendliness of English sympathizers to the direct opposition of Scotch doctors. I had the satisfaction of giving evidence in its favour, when I also had an opportunity of observing the dexterity with which Mr. Bell, as chairman of the Committee, managed the hostile witnesses. It showed me how poor the chances of the Bill would have been if the chairman had been less thoroughly conversant with the points of the case. *A Bill* was passed on June 30, 1852, but not *the Bill* which had been introduced a year previously. In fact it would be difficult to recognize any common principle in the two drafts. On the following day Parliament was dissolved and, Mr. Bell's constituents having been disfranchised for yielding to solicitations which Jupiter did not scorn to use and Danae could not resist, Mr. Bell never sat in another. It was "touch and go" with the first Pharmacy Bill!

As originally introduced by Mr. Bell, the Bill provided that it should be unlawful for any person to exercise the business or assume the name of pharmaceutical chemist unless he was upon the register of pharmaceutical chemists in the manner prescribed by the Bill. As it left the Committee and subsequently became law, it simply confirmed the Charter and constituted a sort of upper grade of "pharmaceutical chemists," who alone were privileged to use that title; but it left the practice of pharmacy as much open to unqualified persons as it had been before.

This was a lame and impotent, and it may be added an illogical conclusion; but in spite of its manifest shortcomings I shall class the passing of this Act as the third great epoch in the history of modern English pharmacy. Let us see how much it actually effected.

1st. It gave legislative sanction to the pharmaceutical profession, placing it upon common ground with the other medical corporations and practically securing it from ever being put under their domination. Thus it was a death-blow to future aggression from that quarter.

2nd. It recognized the fact that the public welfare demanded the enrolment of a qualified class of pharmaceutical chemists; it took measures for creating such a class; and it sanctioned a system of examinations for the purpose of testing their qualifications.

3rd. It entrusted the examination of pharmaceutical chemists (as sanctioned above) to members of their own profession, to be appointed by the Pharmaceutical Society.

4th. It adopted the principle of registration for pharmacists and commissioned the Society with the custody of the register, and generally constituted it the executant of its provisions.

Thus, though it fell far short of what had been asked for, it contained the germ of everything that could be desired.

It will be observed that in the preceding sentences I have (without design) twice applied the term "profession" to the business of a pharmaceutical chemist. It appears to me that the Act of 1852 impressed that character upon it, and that any other word would have been less appropriate. At the same time it must be acknowledged that a great deal of trafficking clings to the skirts of pharmacy, which cannot be distinguished from any other description of retail trading. Pharmacy is, therefore what the individual pharmacist makes it, and if the majority make it a trade, it is not to be expected that the public will look upon it as a profession.

Much fault was found with the Act of 1852, which was stigmatized as a miserable deception, and the blame of its inefficiency was cast upon the Society, Nothing could be more unreasonable. The Society were responsible for the Bill they introduced, but Parliament was responsible for the mutilated form in which it left their hands. "One man may lead a horse to water, but a dozen men cannot make him drink," and the same rule applies to Bills brought into Parliament. The objectors made the mistake of looking at the Act as if it had been final, in which case it would have deserved all their condemnation. Regarded as the first step in pharmaceutical legislation it was most encouraging, securing for the Society a *point d'appui* from which to operate upon a future occasion. Later Acts may confer greater powers, but no subsequent Act can effect such a radical change in the political status of the Society. The Act was accepted in this light by Mr. Bell and his colleagues, shrewd men whose calm judgment was not easily disturbed, and who managed the affairs of the Society in

critical times without ever losing their heads or making a mistake. I wish I knew where to look for their equals now.

The years immediately succeeding were not eventful; the calm succeeded the storm. In 1853 the Council were harassed by a quibbling objection, raised in a cantankerous spirit by one of its own members, to the validity of a bye-law passed with the liberal intention of admitting into the Society, without examination, all chemists and druggists who had been in business before the Act, and who could produce certificates of fitness satisfactory to the Council. The contention was pertinaciously carried through the Courts from 1853 to 1855, when final judgment was given in favour of the Society, with costs against the appellant, in the Court of Exchequer Chamber. The only useful purpose served by this troublesome and costly litigation was to obtain an *obiter dictum* of the judge deciding the vexed question of pharmaseutical *v.* pharmakeutical in favour of "c" soft.

In 1856 Lord Campbell, in his place in the House of Lords, called attention to the prevalence of criminal poisoning and appealed to the Government for further legislation to regulate the sale of poisons. The subject was taken up by the press, and some Bills with that object were brought into Parliament by independent members, but nothing was accomplished in the way of legislation.

In the same year (1856) a Parliamentary Committee reported upon the adulteration of food and drugs.

These movements, though but inchoate, were symptomatic of the direction of popular and parliamentary feeling, and their effect upon the Pharmacy Bill, 1868, and their probable effect upon future Bills in Parliament, must not be overlooked.

The Medical Act, 1858, was the next event affecting, though indirectly, the development of pharmacy. The only provision bearing upon this point was one which assigned the duty of publishing the national Pharmacopœia to the "General Council of Medical Education and Registration," authorized by the Act. This change is greatly to be regretted, for if the publication of the Pharmacopœia had been suffered to remain for a few years longer in the hands of the College of Physicians it might reasonably have been expected that the Pharmaceutical Society would have established its claim to be officially associated with the work. But now it is to be feared that this special enactment, occurring so recently as 1858, may prove an obstacle to an early rectification of what I must characterize as an objectionable anomaly; for there can be no harm in saying in words what the General Medical Council have more emphatically expressed by their acts, viz.: that they are totally incapable of performing the duty that has been imposed upon them. The Pharmacopœia is essentially an official pharmaceutical laboratory book; and what could be more ridiculous than to entrust its compilation to a corporation which (in its corporate character) has never seen the inside of a pharmaceutical laboratory, and to withhold any share in it from those whose lives are spent either in the laboratory or in the after-manipulation of pharmaceutical preparations. Of course the Medical Act theory has utterly broken down in practice. We all know perfectly well, and the Medical Council have been constrained to acknowledge in the preface to the Pharmacopœia, that the work was actually done by our own Professor of Pharmacy, Dr. Redwood, than whom no man is more capable, or equally deserving of the respect of pharmacists for a long life devoted to useful pharmaceutical work. The present arrangement for publishing the Pharmacopœia is a perpetual reproach to English pharmacy, and a painful contrast to the practice in other countries. You may remember that in the year 1874 the Council sent two representatives to attend the International Pharmaceutical Conference at St. Petersburg. One of the questions proposed for discussion was, "Has not the time arrived for instituting an International Pharmacopœia?" Was there not something burlesque in the Society sending two grave and reverend pharmacists all the way to St. Petersburg to consult about a "Pharmacopœia Universalis" for all Europe, when they are not allowed to share in the production of their own? The making of Pharmacopœias is like charity, and should begin at home. This is a grievance that should never be lost sight of until it is remedied. And indeed the pharmacists have the remedy in their own hands. They have only to "strike," and say that they will not help clandestinely, and they must be consulted officially; for I venture to say the Medical Council would not dare to submit to general criticism a Pharmacopœia which had not previously been subjected to pharmaceutical revision. Some may wonder that this important question has not been dealt with by the Pharmacy Bill; but a little consideration will show that a Pharmacy Bill is not the proper place in which to introduce amendments to a General Medical Act. I understand that a new Medical Bill is now before Parliament, and I am strongly of opinion that the Council of the Pharmaceutical Society should seize the opportunity to press this question of the Pharmacopœia temperately, but firmly, in the proper quarter, so that it may now be put upon an honest footing. The present arrangement involves something very much like wearing other men's clothes, which is not a dignified guise for the Medical Council, to say nothing of the unseemly spectacle of pharmaceutical nakedness.

Passing over some minor legislation, which exercised the vigilance of the Society, but left no permanent mark upon pharmaceutical politics, we come to the year 1863, in which year the Medical Council proposed a new Medical Bill intended to amend the Act of 1858. The chief feature of this Bill which demands our consideration was a proposal to include pharmacy amongst the departments of medicine placed under the control of the Medical Council. It also contained a wholesale prohibition against the sale of secret remedies, which exhibited a very small acquaintance with the habits of the people or the temper of the Legislature on the part of those who made it. There is no reason to suppose that the proposal to bring pharmacy within the scope of the Medical Act was dictated by any hostile or aggressive spirit. On the contrary, the Bill marched, in many respects, on the same lines as the Pharmaceutical Society; but the time was not ripe for amalgamation. Nor has the time yet arrived when pharmacy can be incorporated with medicine upon reciprocal terms, and until that can be it is better that pharmacy should continue to walk alone. But I think the time will come, and probably some of you may live to see it, when such a union may take place with advantage to both. Upon the objection of the Society all the clauses affecting pharmacists were struck out of the Bill before it was presented to Parliament, and in lieu thereof the Medical Council adopted the following resolution, viz:—

"That a communication be addressed to the Secretary of State for the Home Department, drawing his attention to the present defective state of the law regarding the practice of pharmacy, under which any person, however ignorant, might undertake it, and expressing the opinion of the General Medical Council that some legislative enactment was urgently called for to ensure competency in persons keeping open shop for dispensing medicines and for the compounding of physicians' and surgeons' prescriptions."

Nothing could jump better with the purposes of the Pharmaceutical Society. The Resolution in effect said to Parliament, "You made a great mistake in not giving the Pharmaceutical Society the powers they asked for in 1852, and the sooner you repair your blunder the better." The Council of the Society were not slow in taking up the ball. In the following May, 1864, they submitted a draft Bill to the Annual Meeting, by which it was unanimously adopted. The United Society of Chemists and

Druggists, which had been formed in 1861 for protecting the trade interests of its members (which it imputed were neglected by the older Society), also promoted a Pharmacy Bill; and the two Bills coming into collision before a Parliamentary Committee, shared (as might have been expected) the fate of the Kilkenny Cats, except that there was not even a tail left between them. In plain English both were rejected, but it will point a moral to compare the leading features of the two Bills.

Bill (No. 1), promoted by the Pharmaceutical Society, proposed that after a certain date it should be unlawful for any person to practise pharmacy unless duly qualified as thereinafter provided.

Bill (No. 2), promoted by the United Society, proposed that all retailers and dispensers of "dangerous drugs" (as per schedule), and all persons keeping open shop for retailing drugs, should be examined by examiners appointed under the Act, and that certain specified regulations should be observed in the sale of active poisons.

Now I beg you to note who was responsible for the first suggestion of imposing regulations upon duly qualified pharmacists in the matter of the sale of poisons. It was not the Society, which had been accused of being the personification of high pharmacy (as though that were a crime), but the rival society which had set itself up as the poor druggist's friend, as the upholder of the trade interests of the struggling many, as distinguished from the advocate of the opinions of the favoured few. We shall have occasion to see presently how the popular feeling of the same "many" was appealed to in order to coerce the Council into breaking their engagements with Parliament in relation to this very question of compulsory poison regulations which the action of the United Society upon this occasion had helped to force upon them.

Mark also, as an important factor in the case, the action of the Parliamentary Committee to whom the consideration of the two Bills had been referred. The Committee reported—

1. "That no compulsory examination or registration under the Bills referred to the Committee should be required of persons now carrying on the trade of chemists and druggists.

2. "That the Bill do provide that no other person shall, after a day to be fixed by the Bill, sell dangerous drugs to be scheduled in the Bill, unless he be examined and registered.

3. "By the adoption of the second resolution as an amendment to a proposal that persons compounding medicines from the prescriptions of medical men should also be examined, your Committee decided against the principal provision contained in the Chemists' and Druggists' (No. 1) Bill, and they accordingly resolved to proceed with the Chemists' and Druggists' (No. 2) Bill."

Now legislation is a practical matter; and how can anyone blame the Society, after this experience, for yielding to the pressure on all sides for poison regulations? They do so because they take no trouble to inform themselves of the facts. It is so easy (and apparently so pleasant) to censure. As Byron said—

> "A man must serve his time to every trade
> Save Censure: Critics all are ready made!"

In further proof of the disinclination of the Council voluntarily to interfere with the discretion of pharmacists, listen to the following extract from a letter addressed officially by the President of the Pharmaceutical Society to the President of the United Society, on March 7, 1866, viz.:—"I think you will agree with me that a mere Poison Bill, fettering us with registration of sales and attendance of witnesses, prescribing a particular form of bottle in which poisons might be kept and sold, and a particular corner in our shops in which they should be placed, would be only an encumbrance to the statute book, inoperative as regards the public, and especially objectionable to men who, if they be properly qualified to deal in dangerous articles, will each, according to the special circumstances of his case, adopt precautions far more conducive to the public safety." The writer of this trenchant passage was Mr. Sandford, who is popularly credited with the desire to force poison regulations down the unwilling throats of his brother pharmacists. Let me take this opportunity of expressing my best wishes for Mr. Sandford (in which I am sure you will heartily join) on his recent retirement from business.

I cannot, however, agree with his vigorous denunciation. Let it be granted that every properly qualified man, who is also prudent, does use suitable precautions—the pharmaceutical millenium has not yet arrived, and all keepers of open shops for the sale, etc., of drugs are not properly qualified, and we may venture to doubt if they are all sufficiently prudent. At any rate, we have a reasonable suspicion that in hundreds of shops no precautions are taken at all. The "laudanum" bottle stands in friendly contiguity to "tinct. rhubarb." by reason of similarity of colour, and the "pulvis antimonialis" is alliteratively located next to the "pulvis antim. tart." If this arrangement does not obtain in the front shop, who shall guarantee that it does not prevail in the dark store at the back, where paper labels sometimes fall off and sometimes become illegible, and where what Captain Marryat called the "Rudimans" are relegated to the tender mercies of the apprentice and the porter? Before too much reliance is placed upon "men properly qualified to deal in dangerous articles" means must be devised for eliminating the disturbing element of "human fallibility" inseparable from the necessary institution of apprenticeship. I have said before, legislation is a practical matter, and it deals with what is, not with what ought to be. If all men did voluntarily what they ought to do, there would be no need for penal legislation of any kind, but I believe it to be a perfectly legitimate function of the Legislature to compel those who require compulsion. The most harrowing fatality by accidental poisoning that has occurred within my recollection would have been impossible if these regulations had been observed, and it occurred in a pharmacy second to none in the United Kingdom. In fact, I scarcely remember a case of fatal mistake in a pharmacy which would not have been prevented by the adoption of the poison regulations which were actually prepared by the Council. All this clamour about "compulsion" is rather childish. It would be as rational to feel aggrieved because "duly qualified pharmacists" are subject to the "compulsion" not to pick pockets. It looks very much like Falstaff's famous excuse—

"What upon compulsion! No—Were I at the strappardo, or all the racks in the world, I would not tell you on compulsion. Give you a reason on compulsion! If reasons were as plenty as blackberries, I would give no man a reason upon compulsion. I!"

The moral of the story is that Falstaff, of course, had not a reason to give.

Untimately, after much negotiation and some concessions, the United Society agreed to co-operate with the Pharmaceutical Society in support of an amended Bill prepared by the Council of the latter, which was submitted to Parliament on May 11, 1868, under the title of "A Bill to regulate the Sale of Poisons and alter and amend the Pharmacy Act, 1852." The poisons regulations had been inserted in deference to the requirements of the Government and as the condition of Government support. They were materially enlarged in Committee, and when the Act issued from the Legislature, its leading features were as follow, viz.:—

1. That it shall be unlawful for any person to retail, dispense or compound certain "poisons" as per schedule unless such person be a pharmaceutical chemist under the Act of 1852, or otherwise registered as a chemist and druggist under this Act.

[As these "poisons" included articles of every day use in medicine, *e.g.*, prussic acid, opium and all its preparations, etc., this provision practically, though not expressly

rendered it unlawful for unqualified persons to practise pharmacy.]

2. From and after the passing of the Act all persons (not having been previously in business as chemists and druggists, or, etc.), shall pass an examination before being registered under the Act.

3. The Pharmaceutical Society was constituted executant of the Act.

4. For the purposes of the Act the Society was authorized, from time to time with consent of the Privy Council, to prescribe regulations as to the keeping, dispensing and selling of "poisons;" and all persons practising pharmacy under the Act were required to conform to the said regulations under a penalty of £5 for each offence.

Parliament contemplated the possibility of individuals offending against the last quoted provision, and therefore attached to it what jurists call a "sanction," in the shape of the penalty alluded to; but apparently Parliament did not contemplate the possibility of the Society itself failing to fulfil its obligations, and it unwisely, as the sequel showed, omitted to attach a "sanction" to that command. But no one has ever questioned the intention of the Legislature, which is plainly deducible from sec. 1 and sec. 15 of the Act. It was understood on all sides that the Society was charged with the duty of prescribing regulations. It was so understood by the Council of the Society, who shortly after the passing of the Act set about framing them—it was so understood by the Privy Council, who were pressing in their request for the regulations to be submitted to them for approval—it was so understood by the Government, who, as soon as they found the Society would not act, brought in a Bill to amend the Pharmacy Act, 1868, by taking the initiative in the matter of poison regulations out of the hands of the Society and placing it entirely under the control of the Privy Council. Thus in a moment the Society found itself at issue with all those powers whose goodwill it had conciliated by years of persistent well-doing; and it is to be feared that the ill impression remains as a black mark against the conduct of the Society and may rise up like Banquo's ghost to shame its next appearance in Parliament. I will not dwell upon the unpleasant topic, but this epitome of the history of pharmacy would be incomplete if I did not record that an angry organized opposition was stirred up against the "poison regulations," though their most furious opponents did not deny that similar precautions (and it was open to them to indicate what they should be) were indispensable; that the Council were weak-kneed and limp in the back and contrary to their convictions withdrew them as regulations to propose them as recommendations, in which form, being entirely emasculated of all potentiality they were accepted at the Annual Meeting, not without a vehement protest on the part of a large minority. You have seen what Mr. Sandford's opinions were, but he behaved on this occasion with a straightforwardness which was both characteristic and commendable. It was no longer a question of opinion, but of fulfilling an engagement, and Mr. Sandford was the only member of Council (if I am not mistaken) who never faltered in the determination to give effect to the Act in the sense in which the Society had accepted it. Mr. Sandford, like myself, is one of a past generation, and had probably read in an old-fashioned book of which a copy may be found in the Library at Bloomsbury—

"Blessed is he that sweareth unto his neighbour, and disappointeth him not; though it were to his own hindrance."

At all events, he acted upon that principle. By a happy chance the Government Bill was withdrawn for want of time at the annual "slaughter of the innocents" on July 17, 1871; and as no other penalty had been provided, the Society was able to congratulate itself that it had lost nothing—but honour.

We have now reached the fourth epoch marked by the Pharmacy Act, 1868, which, so far as legislation is concerned, brings us down to the present time, in which we stand with one foot upon the past and one advanced to the future. Let me now briefly summarize the powers conferred upon the Society by its several public instruments, viz.:—

1. The Charter (1843) granted incorporation to a voluntary Society and defined the conditions of membership, which in future was restricted to persons engaged in pharmacy who should have been duly examined.

2. The Pharmacy Act, 1852, confirmed the Charter. It also constituted a new class of "registered pharmaceutical chemists," which should in future be recruited solely from persons who should give evidence of qualification satisfactory to examiners appointed by the Society; but this Act conferred no substantial privileges upon this new class.

3. The Pharmacy Act, 1868, gave legal status to a second class of "registered chemists and druggists." The qualification of this class (after making provision for vested interests) was also to be ascertained by examiners appointed by the Society; but it was provided that the test examination should be less stringent than that in force under the Act of 1852 for testing the qualification of pharmaceutical chemists, that it should be what has been known as the "Minor" examination. The registered chemists and druggists are therefore a lower grade than the pharmaceutical chemists, but both are equally entitled to be registered under this Act. The privileges of pharmaceutical chemists and of chemists and druggists are therefore at the present time practically the same.

No person not registered under this Act may use any title conferred by this or the former Act, nor may such person deal in any retail manner with certain "poisons" scheduled to the Act. But there is nothing in the Act to prevent unqualified persons from setting up open shops for compounding prescriptions or practising pharmacy, provided they do not call themselves pharmaceutical chemists, or chemists and druggists, and do not meddle with the scheduled poisons.

We are now prepared to consider the merits of—

4. The Pharmacy Bill, 1883.—This Bill differs from former Acts in expressly prohibiting the practice of pharmacy by unqualified persons. The words used are (section 9) "It shall be unlawful to sell by retail or to keep open shop for retailing, dispensing or compounding medical prescriptions, or," etc., unless the seller shall have complied with the requirements of the Act.

The next important enactment is to be found in section 16, viz.: "Every person who, after December 31, 1886, shall obtain a certificate of competent skill and knowledge and qualification under section 6 of the Pharmacy Act, 1868, shall be entitled to be placed on the Register of pharmaceutical chemists and shall be eligible for election to membership of the Pharmaceutical Society of Great Britain according to the Bye-Laws thereof."

[Section 6 of the Pharmacy Act, 1868, prescribed the Minor examination which entitled the examinee to be registered as a chemist and druggist (not as a pharmaceutical chemist), and section 18 of the same Act declared registered chemists and druggists to be eligible as members of the Society. The Bill proposes to make the Minor examination the sole test of qualification, and attaches to it the rank and title of "Pharmaceutical Chemist," with option of membership of the Society as before. The title of chemist and druggist is therefore abolished for the future, and will cease when the present holders under the the Act of 1868 are extinct. But, inasmuch as the Act of 1868 is not repealed, it will not become possible for future interlopers, be they grocers, drysalters, or others, to assume the lapsed title of chemist and druggist, and by so doing to mislead the public as to the character of their business or the extent of their qualification. Beyond that the public must look after itself on the principle of "caveat emptor."]

Next in order of importance come sections 12, 13, 14, referring to examinations; authorizing the Society to

make bye-laws which will enable it to prescribe a "curriculum," and to make other changes which experience has shown (or may hereafter show) to be desirable. Section 13 directs that the Preliminary examination shall be passed before apprenticeship, that is to say that the Preliminary examination shall be preliminary.

Section 3 places wholesale dealers in articles in part 1 of the schedule A. to the Pharmacy Act, 1868, under restrictions somewhat analogous to the regulations imposed by the same Act upon retailers.

Section 4 extends to patent medicines the provisions of the Act of 1868 as to the labelling of poisons.

Section 2 is an extension of the poisons regulations of the former Act to a new class of poisonous articles, but without restricting the sale of such "poisonous articles" to registered or examined persons.

Section 8 provides that the public shall have the same security in branch shops as is enforced in other cases.

The remaining enactments are subordinate and accessory.

You have now before you all that is necessary upon which to form an opinion of the merits of the Bill, and you can come to a conclusion as well as I. I shall deal with this part of the question briefly and broadly, leaving details to be threshed out in discussion as far as time permits. It appears to me that the pervading feature of the Bill is—symmetry. It gets rid of the confusion attending the present variety of titles, viz.: Pharmaceutical Chemist, Member of the Pharmaceutical Scciety and Registered Chemist and Druggist, the relative values of which have proved incomprehensible to the public, who therefore have not learnt to attach any particular value to either; and it substitutes the one title of "Pharmaceutical Chemist," which will depend for its future estimation upon the quality of those who hold it. In this respect the Bill marches upon the lines of the first Bill promoted by the Society in 1850. In respect to the poisons regulations it removes certain of the exceptions which existed under the older Act; and while there seems to be nothing to object to in the slight restraint imposed upon wholesale transactions, which has been called for by a recent *cause célèbre*, the assimilation of patent medicines to other wares is a resonable step. The provision relating to branch shops rests upon the same basis of symmetry, and I cannot understand that any objection can be made to it. The powers in relation to examinations possess the same characteristic, for they will enable the Pharmaceutical Society to regulate its examinations and the course of study incidental to them in harmony with the principles upon which almost all other examining bodies act. But the most distinguishing feature of the Bill is, that in an intelligible and symmetrical manner it connects its enactments with its preamble, thus:—"*Whereas* it is expedient that pharmacists should possess competent skill, *therefore* let no man presume to act as pharmacist who has not given proof of such skill." The preamble was the the same in former Acts, but the enactment was inconsequent, and ran thus:—"*Whereas* it is expedient that pharmacists should possess competent skill, *therefore* let us leave them in their ignorance and allow persons who give proof of such necessary skill to call themselves Pharmaceutical Chemists!" It is true that the later Act of 1868 was less absurd than this, but it was a halting and unsatisfactory measure, needing to be reconsidered and amended as soon as circumstances should permit.

Finally, Should the Bill of 1883 receive your support? That is the practical question. Well, if pharmacists know their own mind, there can be no doubt of the answer. For forty years they have been asking for this very thing. During those forty years no one has come forward to assert that any other object ought to be substituted; and the experience of forty years has but confirmed the policy expounded in 1841 in the general terms "to benefit the public and elevate the profession of Pharmacy, by furnishing the means of proper instruction." This Bill is the result of that forty years' experience, which has shown that "voluntaryism" is incompetent to bring "proper instruction" home to the general body of pharmacists. In one particular only has the Society seemingly deviated from the principles laid down by its Founders. Those worthy men, in a spirit of optimism justified by their own high principles, broke loose from the precepts of tradition, and decided to dispense with everything in the nature of a "curriculum" in the case of those who presented themselves for examination. It would have been impossible in those early days to have done otherwise without postponing indefinitely the work they had taken in hand; but later experience and the systematic development of "Cram" have forced first the examiners and through them the Council back into the time-honoured grooves, which change of opinion finds expression in section 12 of the new Bill. This is after all but an adaptation of means to altered circumstances and implies no abandonment of principle.

There are other topics upon which I should have wished to make some remarks, if it had not been for the absorbing interest now centred upon legislation. Especially I should have liked to say something upon prices, as an important element of pharmaceutical politics. I should have been glad of the opportunity to speak particularly upon the relation which prices of dispensed medicines ought to bear to retail sales, upon which I hold some decided opinions; but these topics sink into insignificance by the side of the momentous question of pharmaceutical legislation, added to which I have already trespassed most unconscionably upon your patience by the unlooked for length to which these observatious have extended.

At the close of the reading of the paper, the discussion was adjourned.

A meeting of the Association was held on Wednesday evening, April 18, when the adjourned discussion upon Mr. R. W. Giles's paper on "Pharmaceutical Politics," was continued.

Mt. R. Winfrey proposed, and Mr. Phillips seconded, the following resolution:—

> "That this meeting of members of the Chemists' Assistants' Association, having considered the 'Draft Pharmacy Acts Amendment Bill,' does in the main approve of such proposed legislation, and trusts the Pharmaceutical Council will receive the necessary support from all sections of the trade to enable them to promote the passing of the Bill by Parliament."

After a long discussion, in which the President, Messrs. Parkinson, R. H. Parker, W. S. Cooper, jun., Wallis, Allcock, Kerr, Luff, Parke, Hartridge, Cracknell, Hadfield, Roper and Millhouse spoke in favour of the resolution, it was put to the meeting by the President, and carried unanimously.

The majority appeared evidently in favour of instituting an honorary examination in addition to the proposed qualifying one.

Parliamentary and Law Proceedings.

Alleged Death through a Cough Mixture.

The adjourned inquest on the body of the child, Arthur Long, whose death was alleged to have been caused by morphia contained in a cough mixture (see before, p. 856) was resumed at the Town Hall, Brighton, on Thursday, April 12.

The mother upon being recalled admitted that she had given the child a "Steedman's powder" shortly after the first dose of the mixture. She had given similar powders on many occasions, but had not noticed the direction accompanying the packet that no other medicine should be given whilst using these powders.

Dr. Ross being recalled said he inquired what

had been given to the child directly he saw it, but could not say whether he heard anything about the powder. He did not think the point was of much importance. He believed that a "Steedman's powder" contained James's powder and calomel, but no morphia; if he had thought the powder contained morphia or opium he would have given more attention to it.

Dr. Stevenson, of Guy's Hospital, was next called, and said he had received a stoppered bottle which contained some human viscera, the stomach and its contents, and part of the intestines, and a second bottle, which contained other viscera, one kidney, a part of the liver, and the urinary bladder and its contents. There were no unusual appearances in this viscera. It was to all appearances healthy, there being no signs of disease. The stomach was empty of food. He had analysed this viscera. He found in the stomach and intestines in the first bottle distinct traces of antimony, and also a trace of morphia, but in an unweighable quantity. He also found a trace of some other matter, possibly mercury. The other bottle contained the liver, kidney and bladder, which showed distinct traces of antimony. He believed there was also a trace of morphia, but the quantity was so small he could only obtain one reaction, and he would not swear to it. A third bottle contained some medicine, in which was present morphia and antimony. The whole bottle, when full up to the neck, would hold 2¼ fluid ounces. The quantity which it actually contained was a little over 1 ounce. The quantity of morphia in the whole bottle if it had been full would be very nearly $\frac{1}{6}$ of a grain of acetate of morphia. One drachm, or one medical spoon, would contain $\frac{1}{110}$ part of a grain of the hydrochlorate of morphia. There was also present a small quantity of antimony, equivalent to about 10 minims of antimonial wine of the British Pharmacopœia in each fluid drachm. He thought that four medicinal teaspoonfuls of the medicine administered in two doses would be sufficient to kill a child of that age. He could not say positively. Asked as to the contents of a Steedman's powder, he said there were two kinds, Steedman's and Stedman's. He had analysed both, but could not charge his mind as to which was which. There were two active ingredients in each, calomel and a preparation of mercury, and one contained morphia and the other a proportion of opium. His analysis had been disputed, and he had examined them again and was sure he was correct in stating this. They both contained morphia as active ingredients, and each contained as much as $\frac{1}{120}$ part of a grain of morphia.

After some further evidence had been given,

The Jury returned a verdict, "That the child died from an overdose of morphia and antimony, through the injudicious administration of various medicines," and added that they were of opinion that chemists in dispensing patent drugs should give more detailed and clear instructions as to their use.—*From the Sussex Daily News.*

BOOKS RECEIVED.

A Manual of Chemical Analysis as applied to the Examinations of Medicinal Chemicals. Third Edition. By Frederick Hoffmann, A.M., Ph.D. and Frederick B. Power, Ph.D., Philadelphia: Lea, Son and Co. 1883. From the Authors.

Agenda du Chimiste. Paris: Hachette and Co. 1883. From the Publishers.

Five Hundred Practical Trade Receipts for Chemists and Druggists. London. 1883. From the Author.

Cacao: How to Grow and How to Cure it. By D. Morris, M.A., F.G.S. Jamaica; and London, S. W. Silver and Co. 1883. From the Publishers.

What to do in Cases of Poisoning. By William Murrell, M.D., M.R.C.P., etc. Third Edition. London: H. K. Lewis. 1883. From the Publisher.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Pharmacy Acts Amendment Bill.

Sir,—Readers of the Journal had last week an opportunity of reading the opinions of two gentlemen concerning pharmacy and the new Bill. Mr. Frazer's opinions will not, I believe, be shared by the majority of chemists. Free trade is undoubtedly the great bulwark of England, but I cannot see that free trade in pharmacy is at all desirable,—no more, in fact, than is that of dynamite. A little has been obtained with each appeal to the Legislature and no doubt we shall get a little more if this Bill is progressed with, if not perhaps all we ask for. If we have to qualify ourselves we have a perfect right to some amount of protection. There will be sure to be opposition to the clause which will touch the legality of stores carrying on a chemist's business; but I do not think that the whole Bill will be endangered because we ask that a loophole in the 1868 Act should be stopped. In fact the different courts of law were undecided whether it was intended by the last Act or not.

The dispensing by stores is more of a vital interest to the chemists of London and a few more large towns; it is not a heart-burning question to the majority of country chemists.

There is far too much reticence observed in asking for extended privileges; we ought to assert them. I maintain they are really for the benefit of the public. Thousands of people place themselves in the hands of chemists; and it is well shown that the trust is not misplaced, by the scarcity of mistakes which occur.

I hope that the new Bill will be well supported by all chemists, and pressure should be brought to bear on it by writing to their representatives in Parliament.

With the new Bill in view and the likelihood of one qualification only being recognized in the future, the severity of the Major examination should be reduced for present Minor men, and not increased, by introducing estimations of solutions for total alkaloids and then for the quinine and such like, in a limited space of time. The present Minor is more difficult than the Major was a few years back, which gives the title of "pharmaceutical chemist" to so many of our present Major men.

Pharmaceutical chemists are a most heterogeneous crowd, with qualifications of all kinds, the worth of which can only be decided by the date of the diploma, whilst there are some who have no qualification, *i.e.*, by examination, at all. The sooner we have one bold front the better.

Darlington. An Associate.

The Registration of Sales of Poison.

Sir,—It would seem sometimes as if, with all our vaunted educational advances and our compulsory examinations, there are still a great many who cannot read, or reading cannot understand, the English of our Poisons Act, in so far as it concerns that portion of the 17th clause which reads, "and on every sale of any such article the seller shall . . . make . . . an entry in a book . . . to which entry the signature of the purchaser . . . shall be affixed."

One would scarcely think it possible for this to be misunderstood, so plainly is it worded. Yet, when entering a sale, I am so often told that "Mr. A—— never requires my signature because he knows me;" or, as is very frequently the case with photographers, that "Mr. B—— never made me sign for cyanide after the first time," that I determined to get official opinion on the legality of such sales. Accordingly, I wrote to the Secretary of the Pharmaceutical Society, and I give below his reply, just received, that those who have hitherto unwittingly broken the law may have no excuse for its further violation.

Extract.—" . . . 'and on every sale' can have no other meaning than that the process (registration) should be gone through every time any of the articles are sold."

Manchester. H. Kemp.

Acetic Ether.

Sir,—As Dr. Clark assumed, I did notice the discrepancy between Professor Redwood's figures and my own.

I think Dr. Clark will at once see the cause (if, indeed, he has not already done so) if he looks at his figures as published in the Journal. He will find that the quantity of rectified spirit given is 10 ounces, not 10 fluid ounces, which it should have been.

I did not, at the time of writing, observe that the same number of c.c. was given as the equivalent of 10 ounces of spirit and 10 fluid ounces of sulphuric acid. I have not yet had time to estimate the amount of acetic ether in the sample I have now on hand, but am quite prepared to find that it contains alcohol, and, indeed, have done so. I may say that I have not made any of the preparation in question for some years. Indeed, having made it and finding its gravity to agree almost exactly with the authority which I consulted, I assumed, not, perhaps, unnaturally, that I had got a pure article, and when I found a house which supplied an article free from acid and of the same gravity, I was satisfied to buy from them, and have done so since.

Liverpool. Alfred C. Abraham.

Parrish's Syrup and Potassium Chlorate.

Sir,—A few days ago, after a mixture consisting of 1 drachm of chlorate of potassium with 4 ounces of Parrish's chemical food had been dispensed some little time, the red colour of the syrup was noticed to have entirely disappeared.

The physician who prescribed the mixture was not aware that such would be the result, for upon seeing the bleached syrup when next visiting his patient he brought it, together with the prescription, back again to the pharmacy for an explanation. He (and his patient too) expected a red mixture, and evidently thought that the chemist was at fault, and not that the chemicals had been at work. Upon finding that the former was not to blame, but that it was the potassic chlorate among the latter which caused so much havoc to be made with the colouring matter, he discarded it, and ordered the simple (?) compound syrup.

Upon making another quantity in the same proportions the red colour gradually disappeared, and in a few hours had passed to that of a pale straw. A portion of the chlorate of potassium remained undissolved.

A cursory examination being made, it was thought that the free phosphoric acid acting upon the chloric radical, eventually reducing it to hydrochloric acid and liberating nascent oxygen, might probably be the cause of the bleaching effect, free hydrochloric being found in the bleached syrup. The original red syrup, however, was found to contain hydrochloric acid. It would appear likely that the cause might be traced to the decomposition of some secondary chlorine compounds, as there is a strong smell of chlorine upon uncorking the bottle containing the mixture even now, the chlorate of potassium being entirely dissolved or rather assimilated.

As there may be some who, not having noticed the above fact, might in such a case be misjudged of having used syr. ferri phosph. instead of syr. ferri phosph. co., they being now forewarned will be forearmed.

I hope that this letter will be the means of again opening up the instructive, interesting and useful dispensing column which lately has been closed, to the regret of many of the apprentices, associates and members of your Society, and that it will lead to further investigation of the subject.

13, *Baker Street, W.* T. H. Prosser.

Pharmaceutical Assistants in India.

Sir,—As an advertisement has recently appeared in the *Pharmaceutical Journal* inviting applications from chemists' assistants for a situation in India, may I be allowed to insert a few remarks upon the general subject, as I have very good reason for believing that considerable misapprehension exists as to the true value of the rupee, and also the cost of living in India.

There are many reasons why a chemist's assistant should be well paid on coming out to India, *e.g.*, the climate is unhealthy and an unnatural one to a European, so much so that instead of a man getting acclimatized through living out here a few years, it is just the reverse; he finds the climate tells upon him the longer he remains. Expenses, taken all round, are 100 per cent. heavier than in England. An assistant is expected to do more than he is in a similar position at home; in addition to long hours, he has night and Sunday duty recurring much more frequently than at home, because often he is single handed, and the so-called chemist, his employer, is not always in truth a chemist. Again, he may have three or four servants to keep, and must do it in unfurnished quarters.

The rupee, nominally two shillings English, is really one shilling and sevenpence (a fraction more or less is neither here nor there), so that to remit £10 home, if he is so inclined, means to put aside 127 rupees,—a rather heavy premium, twenty-seven rupees on a hundred.

He would be a clever man who could manage to save the cost of his passage home in a year on 150 rupees a month. What reward then does he expect for his three years' exile on 100, 125 and 150 per mensem? 100 or 125 rupees a month is mere beggary for a European in this country, a statement which will be re-echoed by every assistant in the land. I am only astonished that any respectable firm should offer such. No man should dream of coming out here on less than 150 per mensem the first year. He ought to get 200 rupees. An assistant cannot throw up his berth just as he likes here; he is practically the slave of his employer, and whether he likes or dislikes his duties or situation, must finish his term, and it behoves him, therefore, to secure for himself the best terms he can. A master may easily find an excuse to act without an incompetent (?) or unsuitable assistant; the latter cannot so easily slip the noose! Minor.

Pharmacographia.

Sir,—In a paper by Professor Henry E. Armstrong, Ph.D., F.R.S., on "Turpentine; its Nature and Adulterations," published in your issue of January 20, 1883, occurs a passage, which I have only just now observed, but which I desire to amend, as it might be misinterpreted. Professor Armstrong has occasion to refer to me, and assigns to me the title "American Editor of the 'Pharmacographia.'" This title, which was probably not meant in a literal sense by Professor Armstrong, does not belong to me. There have only been two editions, in English, of the 'Pharmacographia,' both published by Macmillan and Co., of London, the editors of the first edition being Professor Flückiger and Mr. Daniel Hanbury, and of the second edition, Professor Flückiger alone. No reprint or edition has ever been published in the United States.

The notes which I have been enabled to place at the disposition of Professor Flückiger, as a contribution towards the second edition, were too insignificant both in nature and extent to deserve editorial honours.

New York. Charles Rice.

Errata.—In the paragraph in the "Month," on p. 797, col. ii., respecting the use of stillingia, Dr. Sims's formula should have been given as follows:—

Fl. ext. of Smilax sarsaparilla,
" " Lappa minor,
" " Phytolacca decandra,
" " Stillingia sylvatica, āā ʒij.
Tinct. of Xanthxylon Carolinianum, ʒj. M.

On p. 838, col. ii., line 2 (in some copies), *for* "Bailey," read "Baily."

On p. 839, col. ii., line 5 (in some copies), *for* "10 per cent.," read "6½ per cent."

S. and D. McKinney.—The kola nut is the fruit of *Sterculia acuminata*, and its seeds are known to contain a considerable quantity of theine. We are not aware that any formula for a pharmaceutical preparation has been published. An analysis of the nut will be found in a paper on the "Food Value of the Kola Nut," by Professor Attfield (*Pharm. Journal*, [2], vi., 457).

Minor Associate in Business.—The subject of the first part of your letter is dealt with in the Bill in the sense that you wish; the subject of the second would probably be arranged by bye-law.

D. Buchanan.—We are unable to identify the leaves sent.

Herbalist.—(1) *Lamium purpureum.* (2) *Anemone nemorosa.* (3) *Cardamine sylvatica.* (4) *Fegatella conica.* (5) *Ranunculus Ficaria.*

Communications, Letters, etc., have been received from Messrs. Samuel, Boa, Willing, Sell, Davenport, Hocken.

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See PHARM. JOURN., *March* 10, 1883.

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"Longford, Toleshill, January 12th, 1883.—Dear Sirs,—The preparation, Mist. Cerii Comp., you so kindly sent me, has been of the greatest service to my patients. Mrs. B——, multipara, aged twenty-seven, two months advanced, suffering from persistent vomiting. All ordinary means were used to relieve the reflex irritability of the stomach without avail. Nothing could be retained on the stomach. Emaciation, restlessness, palpitation, vertigo followed—symptoms threatening early death. Injections of prepared beef, eggs, cream, &c., kept the patient alive for ten days. I then gave half-drachm doses of your Mist. Cerii Comp., which immediately checked the extreme irritability of the stomach. On the second day a little champagne and white fish was taken and retained. Since that time the patient has also returned to her usual diet, otherwise she would have lost her life literally from starvation, or had to submit to an operation, which in her weak state would probably have proved fatal. I met her yesterday driving. She now looks the picture of health.—Yours faithfully, HERBERT C. P. MASSER, M.R.C.S." "Birmingham, 18th April, 1881.—The Mist. Cerii Co. is very valuable where there is a tendency to vomiting. I prescribed it in the case of a lady who had aborted every year for six years from the vomiting of pregnancy with complete success; the vomiting was checked, and she is now near her confinement.—J. POSTGATE, F.R.C.S." "Peckham, 7th September, 1880.—My Dear Sir,—I have much pleasure in bearing testimony to the efficacy of your preparation, the Mistura Cerii Co. I have used it both in public and private practice; it is particularly successful in all cases of irritable stomach, Dyspepsia, &c., and *I have found it allay vomiting (no matter the cause) when all other remedies have failed.* Therefore, I can from my own experience strongly recommend its use to the profession.—I beg to remain, yours very truly, RICHARD T. W. SMITH, F.R.C.S., &c."

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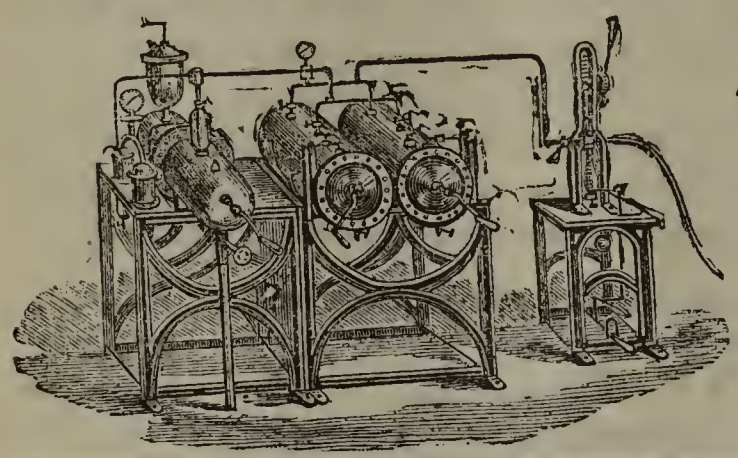

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PREPARED SILVERY WHITE

GUTTA PERCHA ENAMEL,

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CORN AND BUNION PLASTERS,

INVENTED AND ESTABLISHED BY

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EVANS' SALINE

EFFERVESCING.

This preparation is a mixture, in definite proportions, of Howard's Chlorate of Potash, English Tartaric Acid, Bicarbonate of Soda, and a little Cane Sugar. The proportion of these ingredients is fixed, and always remains the same. This, and the pleasant excess of acid, characterises Evans' Saline. A dry mobile powder, dissolving perfectly.

Bottles with Chemists' own name, or in bulk.

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60, Bartholomew Close,
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56, Hanover Street,
LIVERPOOL.

PARIS and MONTREAL.

LIQUOR BISMUTHI. SCHACHT.

Dose, ℥j., diluted.

Great pains are taken to ensure the absolute purity of this preparation. It is not only freed from the ordinary contamination of the metal, such as copper, arsenic, silver, &c., but that which so frequently causes an offensive odour to pervade the persons of those taking the ordinary preparations of Bismuth, namely TELLURIUM, is also most carefully eliminated.

Syr. Cinchonæ Alcoholicus, Schacht.

Bark minus the woody fibre. Dose, 10 to 30 drops, diluted.

Liquor Rhamni Frangulæ, Giles.

A real aperient, mild and constant. Dose, ℥ij. to ℥iv., diluted.

Syrupus Sennæ Aromaticus, Giles.

Made by cold maceration—does not gripe. Dose, ℥j. to ℥ij.

Extractum Cinchonæ Liquidum, Giles

Exhausted entirely with cold water, and prepared by a process specially devised to avoid the changes inseparable from prolonged evaporation. Dose, 10 to 20 drops, diluted.

The above Preparations are manufactured by Mr. Schacht himself in the laboratory of the firm.

GILES, SCHACHT & CO.

52, ROYAL YORK CRESCENT,

CLIFTON;

And can be procured from all Wholesale Druggists in London and the Provinces.

KANGRA VALLEY
INDIAN TEA GROWERS' ASSOCIATION
7, NEW COVENTRY STREET,
LEICESTER SQUARE, W.

PROSPECTUS.

The object of the Planters who have formed this Association is to establish a business for the direct supply of Tea from the Plantations of the Kangra Valley to the public.

So great a success has attended the efforts of the promoters of the Association that it has become necessary that one of the Planters should reside in England to manage its affairs.

The distinctive feature of the business of this Association is that the Tea is delivered to consumers in the original One Pound tin-foil lined parcels in which it is packed in the Valley, and it is guaranteed to be absolutely pure.

Vide **Allen's Indian Mail**, Feb. 28, 1883:—"* * * We can speak from actual knowledge of the excellence of the Teas of the 'Kangra Valley Indian Tea Growers' Association,' and as in advertising them we are also benefiting those who take advantage of their enterprise, we append their modest prospectus, which promises no more than they are well able to perform."

These Teas, retailing respectively at 4/, 3/, and 2/6, can be purchased in any quantity, either direct from the Store, 7, New Coventry Street, or from

Messrs. BARCLAY & SONS, 95, Farringdon Street,

Agents to the Association, from whom Show Cards can be had on application.

Special Terms granted to all Chemists and Druggists, to whom the Teas, on account of their absolute purity, are particularly recommended.

LITHIA, with Potash or Ammonia.
CITRATE OF POTASH WATER.
POTASH AND SODA, B.P.
MINERAL ACID WATER.
PURE LEMONADE AND GINGER ALE.

Sole Makers of Stevenson's Aërated Lime Water.
The above may be had in Bottles or Syphons.

Orders for 6 dozen carriage free.
HOGG & SON, 1, Southwick Street, Hyde Park, W.

REGISTERED.

PURE AËRATED WATERS
Ellis's Ruthin Waters.
CRYSTAL SPRINGS.

Soda, Potass, Seltzer, Lemonade, Lithia, and for GOUT, Lithia and Potass.

CORKS BRANDED "R. ELLIS & SON, RUTHIN," and every label bears their trade mark. Sold everywhere, and Wholesale of R. ELLIS & SON, Ruthin, North Wales. London Agents: W. BEST & SONS, Henrietta St., Cavendish Sq.

SAVARESSE'S CAPSULES

of membrane, each containing 15 drops Pure Maranham

COPAIBA BALSAM,

or, also of membrane, each containing 10 drops Purest Yellow

SANDAL WOOD OIL.

The efficacy of these valuable medicines is due to the ABSOLUTE purity of the Balsam or Oil, and to the very GRADUAL solvability of the membrane as compared with gelatine. Copaiba, 2s. 6d., 18s. doz. Sandal, 4s. 6d., 36s. doz. EVANS, LESCHER & WEBB, London; EVANS, SONS & Co., Liverpool.

Chemists' Tea Agency.

WALKER & DALRYMPLE'S
BROKEN-LEAF TEA, 1s. 8d. per lb.
A MONEY SAVING TEA. ABSOLUTELY PURE.

The small leaf from some of the finest India and China Teas. Produces a tea in the cup stronger, richer, and cheaper than most whole-leaf teas. Agents appointed, where unrepresented, throughout the United Kingdom.

WALKER & DALRYMPLE'S
INTERMEDIATE TEA, 2s. per lb.

BEST at the PRICE EVER SOLD. Great strength, and a most useful tea where there is a large consumption. Recommended to all who wish to SAVE in their tea. Agents appointed, where unrepresented, throughout the United Kingdom.

WALKER & DALRYMPLE'S TEAS.—
AGENTS APPOINTED, where unrepresented, throughout the United Kingdom.

Prospectus and samples free on application.
Warehouses, 154 and 155, Whitechapel Rd., London.
P.O.O. payable at head office. Bankers, the National Provincial Bank of England.

JETTINE,

The only preparation which does not injure the leather.

Produces a perfectly black and permanent gloss, which will not rub off even when wetted, nor soil the most delicate article of dress.

It is invaluable for Ladies' and Children's Boots and Shoes, Waist Belts, Travelling Bags, &c. Each bottle is neatly packed in a cardboard box, and contains a sponge mounted and ready for use: thus JETTINE may be applied without soiling the hands.

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Evans, Lescher & Webb, 60, Bartholomew Close, E.C.
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Newbery, F. & Sons, 1, King Edward St., E.C.
Sanger & Sons, 150, Oxford St., W., or of
E. Penton & Son, 1 and 3, Mortimer St., W.

St. Thomas's Hospital Medical

COLLEGE, Albert Embankment, S.E.—The SUMMER SESSION will commence on MAY 1st. Students who have passed a Preliminary Examination are informed that under the new Regulations of the Royal College of Physicians, it is an advantage to begin in the Summer Session; those entering in Summer are also eligible to compete for the Science Scholarships of £100 and £60 awarded in October.

There are numerous Prizes and Scholarships, and all appointments are open to students without extra charge.

Special Classes for the Examinations of the University of London are held throughout the year.

A register of approved lodgings and of private families receiving students to reside, is kept in the Secretary's Office.

Prospectus and all particulars may be obtained from the Secretary, Dr. GILLESPIE.

W. M. ORD, Dean.

The Middlesex Hospital Medical

School. SUMMER SESSION, 1883.

Lectures and Clinical Instruction in the Wards will commence on May 1st.

Gentlemen can enter to any one Course or to Hospital Practice only. TWO ENTRANCE SCHOLARSHIPS, of the annual value of £25 and £20 respectively, tenable for two years, and a SCIENCE SCHOLARSHIP, value £50, will be offered for competition at the beginning of the Winter Session.

For Prospectus, containing particulars as to other Scholarships, Resident Appointments, Fees, &c., apply to the Dean or the Resident Medical Officer, at the Hospital.

ANDREW CLARK, Dean.

THE

WESTMINSTER COLLEGE

OF

Chemistry & Pharmacy.

The COURSE of LECTURES and CLASSES for the June and July Examinations will be commenced on FRIDAY, APRIL 27th.

In order to secure the comfort of Students during their stay in College, Mr. Wills provides a limited number of Students with Board and Lodging at his Private Residence, Gladstone House, St. George's Road, Southwark.

Terms, Four Guineas per Month.

FEES from April 27th.

(*Inclusive of Lectures, Classes, and Laboratory Instruction.*)

MAJOR or MINOR.

To the June Examination	£5 5s.
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Until Qualified	£10 10s.
Major and Minor, Until Qualified	£15 15s.

PRELIMINARY EXAMINATION.

Students are quickly and thoroughly prepared for the above Examination by **Day Classes, Evening Classes,** or by the **Postal System.**

Students intending to present themselves in July should enter at once.

Students who are studying for their **Preliminary** should send for the EXAMINATION QUESTIONS given for April, 1883, with fully WORKED-OUT ANSWERS AND ESSAY. Price 6d., by post 6½d., or the Papers for January and April, 9d.

EVENING CLASSES for preparing Candidates for the Minor and Major Examinations are held on Tuesday and Thursday, from 7 to 9 p.m. **CLASSES** for Preliminary Students are held every Friday, from 7 to 9 p.m.

For Prospectuses and other information, apply to

Messrs. WILLS & WOOTTON,

TRINITY SQUARE, LONDON, S.E.

SAVARS CUBEB CIGARETTES. Cubebs Stramonium and Cannabis Ind, (soothing). Relief in Asthma, Throat Cough, Bronchitis, Influenza. A specific against fogs. Boxes (12) 1s., 9s. per doz.; (36) 2s. 6d., 24s. per doz. Full directions. EVANS, LESCHER & WEBB, London. EVANS, SONS & CO., Liverpool. Samples gratis, post free.

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IN THE

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7000 Copies Weekly.

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SOUTH LONDON SCHOOL of PHARMACY

325, KENNINGTON ROAD, S.E.

Director: Dr. JOHN MUTER, M.A., F.I.C., F.C.S., &c.

FOURTEENTH SESSION, 1882-3.

A few benches remain for the 3rd B Course, which commenced April 14th. Fees, Syllabus, &c., apply to W. BAXTER, Secretary.

STUDENTS' AIDS TO EXAMINATION.

PRELIMINARY.—Arithmetic and Metric System, 1s. How to Write an Essay, 6d. Latin Grammar and Cæsar Simplified, 1s. MINOR.—Equations Simplified, 1s. Illegible Autograph Prescriptions, 1s. Minor Questions, gratis. Notes on Dispensing, 1s. Prescriptions given at the Minor, 1s. For "How to Prepare for either Exam.," enclose stamped envelope, CHEMIST, care of Mr. J. Edwards, Wye, Kent. Herbarium of Plants, 6s.

THE

CENTRAL SCHOOL OF CHEMISTRY & PHARMACY

Laboratory and School Buildings:

173, MARYLEBONE ROAD, N.W.

The last complete Course of the present session will commence on Monday, April 23rd. Fee to the June examination, 6 guineas ; to July, 8 guineas.

To Students requiring a thorough and practical course of instruction, which cannot fail to convey to their minds the principles of the subjects set before them, this complete course will afford every satisfaction, the teaching at this School being now widely known as efficient, thorough and bearing directly on the subjects required.

For Prospectus, &c., apply to Messrs. LUFF & WOODLAND, 173, Marylebone Road, N.W.

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For Students engaged in business are held daily :— Minor, at 10 a.m. and 7.30 p.m. on Tuesday, Wednesday, Thursday. Preparation for Minor and Preliminary privately and by post. Entrance for June, July and October examinations should be made without delay. Mr. JUDD's Postal Classes, for either examination, Five Shillings per month. *Number* of lessons, lectures and examinations not limited. For Prospectus and particulars enclose stamp.

☞ For personal interview, call at the **CLASS ROOM, 27, Argyle Square, King's Cross, W.C.**

Address all correspondence to

Mr. H. JUDD,

29, Great Coram Street, W.C.

PHARMACEUTICAL PRELIMINARY,

LONDON Matriculation, College of Preceptors, Apothecaries' Hall, Glasgow, Edinburgh, and all Medical Preliminaries. Rapid and thorough preparation, privately and in class. Also postal tuition for these examinations and Bell Scholarship. For particulars enclose stamp, Mr. DAWES, 1st B.A. (Lond.), 11, Burton Crescent, London, W.C.

PRIVATE TUTOR

Mr. JAS. W. SAUNDERS

(*From the Royal School of Mines*),

130, CAMDEN ROAD, N.W.

EIGHT of my Students presented themselves at the February Minor, **FIVE** passed. **PERSONAL TEACHING. NO DEMONSTRATORS.** Postal Instruction if required. Enclose stamp for particulars and terms ; or "at home" daily from 1.30 to 2.30.

Laboratory close to Gower Street Station.

Terms for Advertisements may be had on application to the Publishers, Messrs. J. & A. CHURCHILL, 11, New Burlington Street, W. Those for Businesses for Disposal, &c., &c., will be found on the preceding page.

ENGAGEMENTS WANTED.

BY a young man. Aged 23. In London or suburbs. As JUNIOR. With time for lectures and study. Can be well recommended. Small salary. W. J. C., Messrs. Hasselby & Co., Doncaster.

AS TRAVELLER in the Wholesale, Drug or Druggists' Sundries, by Chemist, at present Managing Retail business. Age 28. Unexceptionable references. EVANS, Apothecaries' Hall, Town Hill, Wrexham.

JUNIOR. In London. Age 20. Till 2 p.m. for study. Can Prescribe and Extract Teeth. Understand Postal and Telegraph duties. Abstainer. Good references. C. ELLISSON, Hoyland Common, Barnsley.

LOCUM TENENS. — Mr. W. B. WEST, Staines Rd., Hounslow. 30 years' town and country experience, and unexceptionable references as Temporary Manager extending over the last 12 years.

A GENTLEMAN seeks an out-door ASSISTANCY, with a view to Partnership, in a first-class Dispensing and Family business. Good references given and required. MEDICUS, care of J. H. Hill, Esq., 42, High St., Oxford.

MANAGER or ASSISTANT. Out-door preferred. Qualified. Over 15 years' varied experience. Good Prescriber and can Extract Teeth. Married. No family. Full particulars to T. J., Mr. Morris, Chemist, Hereford.

MANAGER. Temporary or otherwise. Good references. Total abstainer. Passed Minor. Postal knowledge. Terms moderate. Age 31. CHEMICUS, 1, Garibaldian Villas, Somerset Rd., Tottenham, Middlesex.

AS ASSISTANT. Mixed country trade. Permanent. Comfortable home. General improvement, especially Dispensing, with reasonable recreation. Total abstainer. In or out-door. Age 31. FINEM RESPICE, Eastwood, Notts.

MANAGER of Branch. Age 30. Minor qualification. Registered Dentist. Married. A permanency required. Mixed country and town experience. J., 448, Southwark Park Rd., London, S.E.

ADVERTISER, an efficient Dispenser, having a sound knowledge of the Drug Trade, desires evening employment. Terms very moderate. Excellent reference. CHEMIST, 62, Waterloo Bridge Rd., S.E.

AS ASSISTANT. Where two or more are kept. London or South Coast. Age 23. 8 years' experience. Disengaged May 1st. S. S., 10, Falmouth Rd., S.E.

LOCUM TENENS or Temporary ASSISTANT. Qualified. By the day, week or month. Town or country. CHEMICUS, 51, Judd St., St. Pancras, W.C.

AS ASSISTANT or Second ASSISTANT. London preferred. Age 24. Height 5ft. 8in. 8 years' experience. Can Prescribe and Extract Teeth. Good reference. Z., Messrs. Newbery, King Edward St.

AS ASSISTANT. London or suburbs. Age 24. Good references. Town and country experience. W. H., 12, Westbourne St., Sloane Sq., S.W.

AS ASSISTANT. Out-doors. Age 27. Requires a situation in a Wholesale Drug House. Wholesale and Retail experience. Excellent references. CHEMICUS, 51, Aubert Park, Highbury Park, London, N.

AS Junior ASSISTANT in good class Mixed trade. Salary less an object than improvement in business. Age 20. Height 5ft. 11in. G., Mr. Nurse, Spilsby.

AS ASSISTANT in a good house of business. Country preferred. Minor qualification. Age 22. Height 5ft. 8in. H. S., 134, Lisson Grove, London, N.W.

ENGAGEMENTS WANTED.

AS ASSISTANT in a good Dispensing business. In or out-door. Age 27. Height 5ft. 10in. First-class West-end reference. Disengaged. STATIM, 31, Paultons Sq., S.W.

TEMPORARY. Ætat. 31. By day, week or month. Town or country. Thoroughly experienced in all branches. Irreproachable references. Terms very moderate. Disengaged. A. WOOD, 4, Woodfield Cres., W.

AS MANAGER. A gentleman of long experience in first-class Retail (Pharm. Chemist), is open to an engagement. Temporary or otherwise. Highest references. LEX, 2, Westbourne Park, Bayswater.

IMMEDIATELY.—As JUNIOR or IMPROVER. Age nearly 20. 3½ years' experience. Willing and obliging. Good references. Please state particulars. MISTURA, Regent House, High St., Carnarvon.

AS ASSISTANT. With or without time for study. In London preferred. Age nearly 21. Height 5ft. 11½in. More than 6 years' experience. DELTA, 16, Adelaide Ter., Portishead, Somerset.

AS JUNIOR. Age 20. Height 5ft. 8in. Over 4 years' experience. First-class reference. Disengaged. London preferred. B., 9, Upper Rock Gardens, Brighton.

AS Second ASSISTANT. Out-door. A permanency. Age 24. 5ft. 8in. in height. 9 years' experience. In or near town preferred. Highest references. Disengaged. A., Mrs. Sutton, The Common, Streatham, S.W.

TEMPORARY.—As TEMPORARY, for one, two, or three months. J. B. BOLAS, Hartford, Cheshire.

ASSISTANTS WANTED.

IMMEDIATELY.—JUNIOR or IMPROVER, with some knowledge of Dispensing, for Mixed country trade. Hours 7.30 to 8, alternately with 9. Little Sunday duty. Christian young man, Dissenter preferred. Small salary at first. State age and full particulars, salary, height, and photo., with references, to WILLIAMS, Chemist, Coleford, Gloucestershire.

MESSRS. DUTTON & SON, Rock Ferry, Birkenhead, require an ASSISTANT. Liberal salary to one well up in Dispensing and accustomed to a good Family business. Address, with particulars, references, &c., enclosing carte de visite.

A SENIOR. Out-door. About 27 years of age. Must be a thoroughly competent Dispenser and neat writer. Apply, stating age, salary expected, and all previous engagements, to H. THOMAS, Chemist, St. Leonards-on-Sea.

AN ASSISTANT. In-doors. Age not less than 23. For a good class business. Must be an accurate Dispenser, and accustomed to the Retail counter. State full particulars, with salary, and with whom last employed, to EDWARD POORE, Chemist, Broadstairs, near Ramsgate.

A JUNIOR ASSISTANT. One only kept. Must be quick and active. Good Dispenser. One who has just completed apprenticeship in country business not objected to. State experience, reference, and salary required. Send photo. if convenient. J. W. FELTWELL, Chemist, 91, Hammersmith Rd., West Kensington, W.

AN ASSISTANT. Accustomed to a good country business. Also an IMPROVER. Apply, with references, stating age, qualification, salary required, if possible with carte, which shall be returned, CORFE, Chemist, Maidstone.

CLARE & HUNT, Scarborough, are in immediate want of an ASSISTANT. Must be an efficient Dispenser and accustomed to the routine of a first-class business. Apply stating full particulars.

ASSISTANTS WANTED.

AT once.—A steady obliging JUNIOR, used to Mixed country trade. Reference and usual particulars may be sent to JOHN LITCHFIELD, Chemist, Longton, Staffs.

AT once.—An ASSISTANT to a light class and Dispensing business. But must be well up in Dispensing or need not apply. Good salary will be given to a first-class man. Apply, 100, Wyleys & Co., Coventry.

IMMEDIATELY.—MANAGER for small branch. Light Retail and Dispensing. Married. Can have use of house and gas. State age, family, salary, &c. Apply, by letter only, to ALPHA, 21, Hicks Rd., Seaforth, near Liverpool.

R. HUMPHREYS, 12A, Upper Belsize Terrace, N.W., near the Swiss Cottage Railway Station, is in want of an ASSISTANT, not under 21. In-door. Single. Minor qualification, at least. Town reference and experience. Apply personally.

JUNIOR (advanced). Must be well up and have had good experience at Dispensing, &c. Also must have good reference from last situation. SENIOR wanted, to undertake Management of a Branch. Apply, after 7 p.m., 98, Seven Sisters Rd., Holloway.

IN pleasant suburb.—A trustworthy ASSISTANT. A good Prescriber. Commencing salary £80, with furnished apartments, coals, gas, and attendance, not board. Time allowed for recreation daily. T. BENNETT, 96, Beckenham Rd., Penge, S.E.

AN experienced ASSISTANT, Minor. Age about 24. In-door. Liberal salary to a good man of business. Apply by letter, with full particulars of previous engagements, to T. Y. C., care of Messrs. Hodgkinsons & Co., Upper Whitecross St., E.C. One who has lived as Junior in a good house will have the preference.

BY a Medical man at Brighton, a DISPENSER and BOOKKEEPER. Out-door. Apply by letter, stating age, references and salary required, to F. R., care of Messrs. Savage & Adams, Chemists, St. James' St., Brighton.

AN ASSISTANT as Dispenser in a first-class Dispensing establishment in a fashionable town. Salary £50. Age not less than 25. Unexceptionable reference and good address indispensable. Apply, with full particulars, to K., care of Messrs. Barclay & Sons, 95, Farringdon St., London, and if not answered in reasonable time declined.

JUNIOR or IMPROVER in a light Retail and Dispensing business. There being a Post Office he will be required to give attention occasionally. State full particulars and enclose carte, to W. HANNAFORD, 123, Granby St., Liverpool.

APPRENTICE.—RUPERT H. CUMINE, Chemist by examination, Woodgrange Rd., and Broadway, Forest Gate, E., has a vacancy for an intelligent, well-educated youth, about 16, as an APPRENTICE for four years. Exceptional opportunities and home comfort. In a healthy locality. Reference to friends of present apprentice. Premium required, £80.

AN in-door ASSISTANT. Not under 21 years of age. Accustomed to a good class of business. One who desires a permanency preferred. Hours easy. Apply to WALTET GREGORY, Wellington, Somerset. Also a vacancy for an in-door APPRENTICE.

AN ASSISTANT, about 23 years of age. Able to Extract Teeth. For a light Retail and Dispensing business. Apply personally, or if by letter enclose carte (to be returned) and usual particulars, to B., Messrs. Flood & Co., 102 and 103, Blackman St., Borough, S.E.

JUNIOR. In a light Retail and Dispensing business. Must be a quick and accurate Dispenser. Applications not answered in three days declined. SHEPLEY, 169, Brockley Rd., S.E.

ASSISTANTS WANTED.

IMMEDIATELY.—A Junior. Accustomed to general Retail and Dispensing business. In-doors. Hours of business light. No Sunday duty. Apply to W. Smith, High St., Abingdon.

IMMEDIATELY.—An Assistant. About 25 years of age. For a light Retail and Dispensing business. Apply, W. Griffiths, Cirencester.

MR. R. WALKER, 100, Brompton Rd., S.W., is in immediate want of an experienced Assistant. Minor qualification preferred. Applicants writing will please state full particulars.

MR. T. L. REEVE, New St., Birmingham, will require about the 9th May a competent Assistant, for the Retail counter. Not under 24 years of age. Gentlemanly in appearance, and possessing good business habits. Minor qualification preferred. Applicants please state full particulars as to salary, height, &c., and enclose carte, or apply personally. Four other young men kept.

AN able Assistant, for one of our firms in the East. Apply by letter to A. S. Watson & Co., 106, Fenchurch St., E.C.

IMMEDIATELY.—A Junior Assistant, accustomed to Dispensing and Retail counters. Good reference indispensable. Send carte. State salary and to whom reference may be made. Also an Apprentice having passed Preliminary. Premium required. Good opportunity. Comfortable home. Batting & Co., Chemists and Dentists, Tunbridge Wells.

JUNIOR Assistant or Improver. About 21 years of age. Must be accustomed to good Mixed country business. In-doors. Hours 8 to 8.30. Address, enclosing carte (to be returned), with full particulars, P. Smith & Co., Chemists, Runcorn.

AN Assistant, for the Wholesale Chemical department. Immediately. Apply, stating age, reference and salary required, to Mawson & Swan, Mosley St., Newcastle-on-Tyne.

THOROUGHLY qualified Assistant. Out-door. Particulars and photo. to Carlton & Sons, Horncastle.

AN in-door Assistant. Age about 22 years. Minor qualification. Accurate Dispenser. Gentlemanly manners. Churchman preferred. State full particulars and salary required, to M., care of Messrs. Hodgkinson, 198, Upper Whitecross St., London.

MESSRS. THRESH & WRIGHT, Pharmaceutical Chemists, Buxton, Derbyshire, have a vacancy in their establishment for a well educated and gentlemanly youth as Apprentice. Every opportunity will be afforded for obtaining a thorough knowledge of the business in all its branches. Premium required.

THE General Apothecaries' Company require a competent Junior Assistant (out-door), for their City branch. Apply personally to Mr. J. J. Pierce, 27, Bishopsgate St. Within.

AN out-door Assistant. Must be well up in Dispensing, and a good counter hand. Apply, enclosing carte de visite and stating salary expected, also full references, to Gouldings, Cork.

AN Assistant. Of gentlemanly appearance and address. About 26 years of age. Who has been accustomed to first-class Dispensing business. Apply, stating age, height, reference and salary required, and enclose carte (to be returned), to Mr. Jameson, 48, Baker St., W.

CLERK in a Wholesale Drug Warehouse. To one who writes a good hand, understands bookkeeping and can write shorthand from dictation, a liberal and progressive salary (in-door) will be given. Apply, with full particulars, to B. A., care of Messrs. Evans, Lescher & Webb, 60, Bartholomew Close, London, E.C.

ASSISTANTS WANTED.

A SENIOR Assistant. Qualified. In-door. About 25 years of age. For a general country business. To one who is competent and suitable a good salary will be given. Apply, with full particulars of age, height, previous experience, &c., to Messrs. Dunhill & Stiles, Pharmaceutical Chemists, Doncaster.

A COMPETENT Assistant (2 kept), who has been accustomed to first-class Dispensing and Retail. Age about 25. Minor qualification preferred. Must be gentlemanly and of good address. Apply, stating age, height, salary required, and usual particulars, with carte, to Geo. Gibbons, Pharmaceutical Chemist, 24, West St., Weston-super-Mare.

AN Assistant. In-door. For a light Retail and Dispensing business. Apply, stating usual particulars and salary required, to P. Hall, 118, Grey St., Newcastle.

A JUNIOR. Where two are kept. Must be active, obliging, and steady. Address, enclosing carte, stating salary required and references, to A. J. Evans, Chemist, Dorchester.

J. M. BUCK, Pharm. Chemist, Bedford St., Liverpool, requires a good Junior, of gentlemanly appearance and good address. Must be a reliable Dispenser, and accustomed to good Retail. Time allowed for study if required. Apply, stating age, height, experience and salary required, in-door.

A GOOD Junior. Immediately. Accustomed to Dispensing and light Retail. Apply, personally or by letter, enclosing carte de visite (which will be returned). Address, T., 9, Weston Ter., Green Lanes, London, N.

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AN Improver required. Books and plenty of time will be given for study for the Minor. Address, Mr. Heath, Chemist, St. Mary Cray, Kent.

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Shops completely fitted at a week's notice.

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MESSRS. ORRIDGE & CO., CHEMISTS' TRANSFER AGENTS, may be consulted at the above address on matters of SALE, PURCHASE, and VALUATION.

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VENDORS have the advantage of obtaining an opinion on Value, derived from extensive experience, and are in most cases enabled to avoid an infinity of trouble by making a selection from a list of applicants for purchase, with the view of submitting confidential particulars to those alone who are most likely to possess business qualifications and adequate means for investment.

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The Reply.

In response to many inquiries from the Trade as to the result of the action we brought against Messrs. F. S. Cleaver & Sons for the infringement of one of our Trade Marks, we beg to say that Messrs. Cleaver & Sons having represented to us that they had acted unwittingly in copying the name "EDENIA" from the Lundborg Label,—claiming that they did not know we had registered the name,—we have discontinued our action against them, on their signing an undertaking to the following effect:—

Messrs. Cleaver & Sons shall discontinue the use of the word "EDENIA," and deliver up to Burroughs, Wellcome & Co. all labels, circulars, blocks, plates, stones, or stereos bearing the word "EDENIA." Messrs. Cleaver & Sons to inform all customers to whom they have sold perfumes under the name "EDENIA," that Burroughs, Wellcome & Co. claim to be the Proprietors of the Trade Name and Trade Mark thereof, and shall request such customers to return the said perfumes.

Messrs. Cleaver & Sons shall render an account of the sale of all articles under the name "EDENIA," and shall pay all profits thereon to Burroughs, Wellcome & Co. Messrs. Cleaver & Sons forthwith to publish an apology in the personal column of *The Times*, *Standard*, *Daily Telegraph*, *Daily News*, and *Daily Chronicle* in London, and in the leading daily paper in Edinburgh and Dublin; also in *The Chemist and Druggist* and in *The Pharmaceutical Journal;* also in such country papers in the United Kingdom as they have advertised "EDENIA" in; also in the following New York papers—*The Daily Herald*, *The Druggists' Circular*, *New Remedies*, *The Paint, Oil, and Drug Reporter*, and shall furnish Burroughs, Wellcome & Co. with a copy of each of the above-named papers having the apology marked. Messrs. Cleaver & Sons shall pay Burroughs, Wellcome & Co.'s cost of this matter as between solicitor and client.

We may remark that an infringement makes the offender equally liable, whether such infringement be intentional or not. The highest judicial decisions render this perfectly plain.

Very respectfully,

Burroughs, Wellcome & Co.,
Manufacturing Chemists.

Snow Hill, London, E.C.

London: Printed by William Inglis Richardson, 4 and 5, Great Queen Street, Lincoln's Inn Fields, and Published by Messrs. J and A. Churchill, 11, New Burlington Street.

The Pharmaceutical Journal AND Transactions.

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Pharmaceutical Society of Great Britain,

17, BLOOMSBURY SQUARE, LONDON.

ELIAS BREMRIDGE, Secretary and Registrar.

NOTICES.

SPECIAL NOTICE.

Next Monday, April 30th, is the last day on which the Secretary can receive Subscriptions.

EXTRACT FROM THE BYE-LAWS.

SECTION 1, CLAUSE 10.—"All Subscriptions for the Current Year shall become due upon election, and *all Annual Subscriptions shall become due on the first day of January in every year;* and if any Member, Associate, or Apprentice or Student shall not have paid his annual subscription before the first day of May in any year, his name shall be omitted from the Register of Members, Associates, and Apprentices or Students of the Society certified by the Council at the Annual Meeting."

SECTION 17, CLAUSE 3.—"Any Member or Associate, Apprentice or Student, desiring to retire from the Society, shall send notice thereof to the Secretary in writing, together with the Certificate or Diploma of Membership, if any, held by him. *No Member or Associate shall be released from his obligation to pay his annual subscription until such time as the Certificate or Diploma of Membership, if any, shall have been returned.*"

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Cheques and Post Office Orders should be made payable to the Secretary, and crossed "London and Westminster Bank."

ANNUAL GENERAL MEETING.

Notice is hereby given that the forty-second Annual General Meeting of the Members and Associates in Business of the Society will be held at 17, Bloomsbury Square, Middlesex, on Wednesday, the 23rd day of May, 1883, at eleven o'clock in the forenoon for twelve *precisely*, to receive the Report of the Council, and to elect the Council and Auditors for the ensuing year.

By Order of the Council,
ELIAS BREMRIDGE, *Secretary and Registrar,*
17, Bloomsbury Square.

THE JACOB BELL MEMORIAL SCHOLARSHIP.*

TENABLE FOR ONE YEAR.

TWO SCHOLARSHIPS are offered annually, and come into operation at the commencement of the Session in October. Candidates for these Scholarships must be Apprentices or Students of the Pharmaceutical Society, under twenty-two years of age, and have passed not less, or been engaged not less, than three years in the pharmacy of a Registered Pharmaceutical Chemist or Chemist and Druggist.

Each Scholarship is of the annual value of thirty pounds, and is to be held for one year. In addition to the Endowment, the Council provide free Laboratory instruction and admission to the lectures to the holders of the Bell Scholarships; and books of the value of five pounds, given by Mr. T. H. Hills, are divided equally between them.

The examination for these Scholarships takes place on the first Tuesday in July. Candidates desiring to compete must send notice to the Secretary, accompanied by Certificates of age and testimonials from their previous Employers or Masters as to capability, industry, and general conduct, on or before the first day of June.

Further particulars can be had on applying to the Secretary, 17, Bloomsbury Square.

* A scholar is supposed to be *commencing* his studies, or at least to have made only that progress which may be reasonably looked for during an apprenticeship. The object of the examination is to ascertain that the candidate has such an amount of ability, and affords evidence of having made such use of it in the acquirement of elementary knowledge, as will justify the expectation of his proving a successful student who may do credit to the appointment, and become a useful and accomplished member of the pharmaceutical body.

Special Notice to Advertisers.—See page iii.

THE TWELFTH ANNUAL DINNER

OF THE

Members of the Pharmaceutical Society

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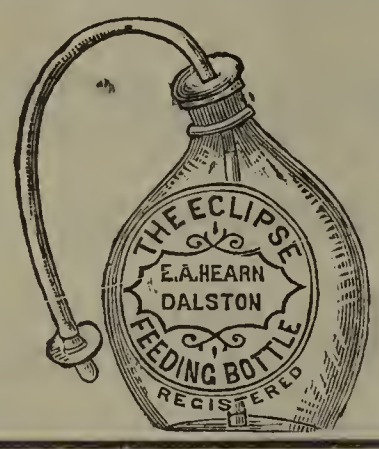

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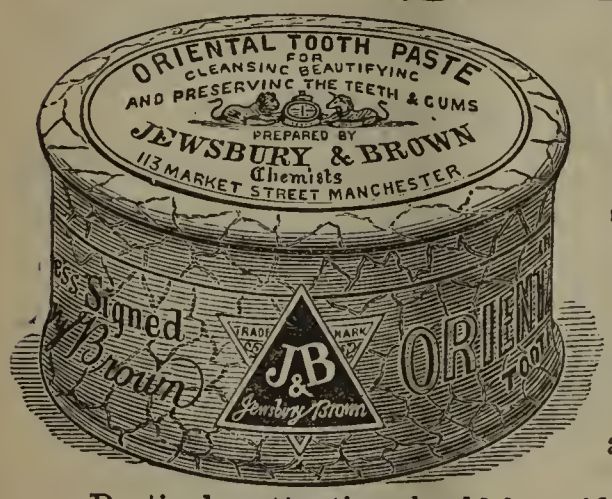

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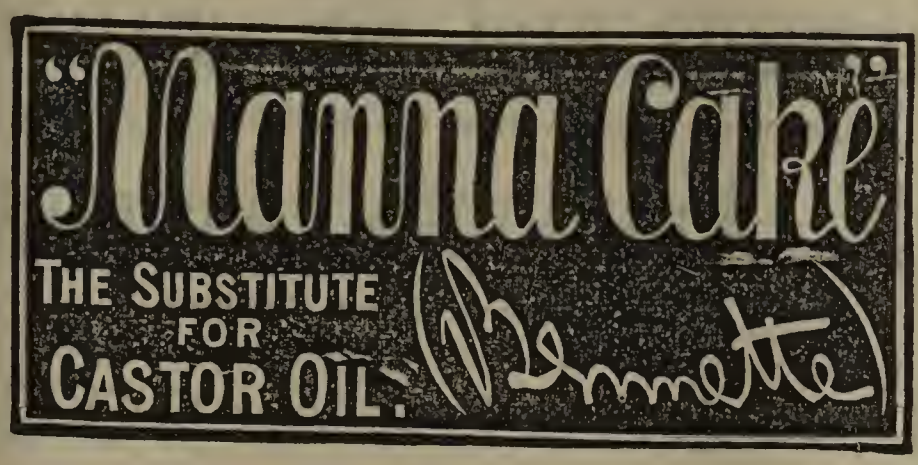

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"New York Medical Journal," *August* 1880.
Dr. F. Weir,
in Lecture delivered to the College of Physicians and Surgeons, New York.

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"THE MONTH."

The proverbial April showers have this year been conspicuous by their absence, and in spite of the warm sun and the fact that the time of the singing of birds is come, the floral harbingers of spring have not yet assumed their wonted beauty. The cold nights and keen north-east winds have in many places nipped the young buds, and probably by lessening the supply of sap have prevented the proper development of the flowers. At the Botanical Gardens, Regent's Park, the almond trees and mezereon can hardly be said to have blossomed, so few and short lived have been the flowers. In the Economic House, however, the cassia and cinnamon plants have presented a very pretty appearance, the graceful panicles of small white flowers and the young leaves tinged of a brilliant crimson forming quite a picture. At Mr. Ware's nursery, Tottenham, several interesting medicinal plants were observed in blossom. Among these were *Adonis vernalis*, only recently introduced into medicine, *Anemone Pulsatilla*, *Mandragora officinalis* and *Sanguinaria canadensis*.

In sheltered nooks in the South some early flowers may be met with, but even in the Isle of Wight a correspondent could only find this month one hundred and twenty-three species as against one hundred and fifty-eight at the same date last year. Among those noticed by him were *Genista tinctoria*, *Helianthemum vulgare*, *Sanicula europæa* and *Pedicularis sylvatica*. *Smyrnium Olusatrum*, a plant which was formerly used in medicine, under the name of Alexanders, may now be found in sunny places by the seaside in the South of England, just opening into blossom, and the pinkish flowers of the butterbur, *Petasites vulgaris*, may be met with by the sides of streams and in damp places, where later on its leaves will form a far more conspicuous object.

In the Winter Garden, at Kew, *Smilax China* is now in flower. The flowers are small and green, but the red tints of the young shoots, the leaf-stalk and peduncles, as well as the bronze shades of the bright shining foliage, render the plant a pretty object. The woody tuberous root forms the China root of commerce, an article now rarely imported.

In the open ground at Kew several medicinal plants are in bloom. The purplish blossoms of the asarabacca (*Asarum europæum*) and the American wild ginger (*Asarum canadense*) are so hidden underneath the leaves that they might easily pass unobserved. The anthers in these flowers, sessile on the style and terminating in pointed appendages, are worth notice. The former species is sometimes found in botanical gardens, labelled *A. canadense*, but the latter is easily distinguished when the two grow together by its larger hairy leaves and larger flowers with reflexed sepals. The broad leaves of the colchicum now form a conspicuous object and are in the best condition for the herbarium. *Podophyllum peltatum* is opening its leaves after the fashion of a miniature umbrella and the white flower buds are just peeping forth. Several rare British plants may also be looked for in blossom this month. *Doronicum Pardalianches*, *Leucojum vernum*, *Myrrhis odorata*, *Corydalis solida* and *C. lutea*, *Fritillaria Meleagris*, *Muscari racemosum*, *Allium triquetrum*, *Ornithogalum nutans*, *Geum rivale* and *Claytonia perfoliata* are all now in blossom at Kew and should be looked for in the localities where they grow wild. The horsetails, too, are now sending up their fertile stems, so different in appearance from the barren ones produced in the early summer as to be scarcely recognized by the tyro in botany. *Equisetum arvense*, in clayey fields and by roadsides, and *E. maximum*, near ponds and in damp places, are the most noticeable species at this time of year; the latter is distinguishable at sight by its much larger size, the heads bearing the sporangia being often 2 inches long and more than ½ inch in diameter. The curious elaters borne by the spores are best seen by examining them in the dry state with a hand-lens or microscope, as when wetted they curl round the spores and are much less noticeable.

Adenandra fragrans, the leaves of which were offered as buchu in the London market a short time ago, is now in flower at Kew. The curious glandular bodies at the apex of the stamens, which give the name to the genus, are curved back between the petals when the anthers open, while at the base of each petal there is an erect cylindrical staminode or abortive stamen tinged with pink. Whether or no these appendages are useful for attracting insects does not appear to be known.

The yellow root, *Xanthorrhiza Apiifolia*, a North American tonic bitter, containing berberine, official in the U.S.P. of 1870, but now expunged, is also at present flowering freely at Kew, forming a fine mass in the dell near the flagstaff, where the cool damp soil suits it perfectly. It is a small bush with yellow creeping underground stems, which send up abundance of suckers and thus form a large clump. The leaves are irregularly pinnate and the minute flowers are borne in rather large branching spikes of a dark purple colour.

From Mr. Lynch, the Curator of the Botanical Gardens at Cambridge, we learn that the mastic tree is now in flower there, a somewhat rare occurrence. *Anemone Pulsatilla* and *Cochlearia officinalis* are in full bloom and the sumbul plants are pushing up strongly, quite uninjured by the bitterly cold winds. Among many other rare British plants, *Selinum carvifolium* is now being cultivated successfully at these gardens.

At a recent meeting of the Linnean Society, the leaves of *Arum italicum* were exhibited, obtained from a new British locality. Swanage, Torquay and Folkestone Warren have already been added to the list of localities where the plant occurs in Britain, and doubtless it will be found in many other places on the South Coast by those who will take the trouble to look for it. The leaves are of a shiny glossy green, quite different from the dull green hue of *A. maculatum*; the spadix is yellow and the spathe much more membranous, and the plant flowers in May and June.

At a recent meeting of the Hertfordshire Natural History Society, Professor Attfield communicated some observations on the sap of the birch tree, in addition to those already published in this Journal. A suggestion having been made to him that the sugar contained in the sap was probably the result of the action of some schizomycetous fungus or other ferment, a specimen of sap was re-examined by Mr. Dunstan, at the request of Professor Attfield, and the presence of a ferment capable of transforming starch into sugar was recognized. When estimated by Messrs. Dunstan and Dimmock's process (*Pharm. Journ.*, [3], ix., 733), it was found that the quantity of this ferment contained in one gallon of the sap was capable of converting into

sugar 21 grains of dry starch. It appears probable that like other ferments this one may become active on reaching a certain temperature and become inactive below it. An investigation in this direction might reveal some interesting results. Some experiments made about ten years ago by Mr. W. S. Clark, the President of the Agricultural College of Massachusetts, showed that the composition of sap differed remarkably according to the date of its flow, and also in the time at which it began to flow, and in the rate of pressure exerted. The temperature of the soil and of the atmosphere also gave rise to variation in amount. The relation which the structure of the wood in different trees and the time of flowering bear to the flow of the sap are other points worthy of investigation.

Probably most botanists have observed the central purplish flower in the umbel of the carrot, but may not have noticed whether it was sterile or fertile. In the *American Journal of Pharmacy* (1882, p. 585), Professor Maisch remarked that the central flower was usually barren in the United States as in Germany. In the same Journal (1883, p. 163) it is now stated that the flower is usually represented as fertile in Europe and sterile in the United States. Mr. Thomas Meehan, however, points out in the *Proc. Acad. Nat. Science*, Philad. (1882, p. 221), that while in the first umbel expanded the purple flower is fertile, this is not the case with those in the umbels from lateral shoots.

In Hanbury's 'Science Papers' (p. 238, fig. 5), a seed named *Te-tsaou-tow*, is figured, and doubtfully referred to "*Dialium*? *Leguminosæ*," of which at that time the plant was unknown. In the last number of Hooker's 'Icones Plantarum,' the plant yielding these seeds is figured and described, having been previously named by Dr. Baillon. It belongs to the genus *Gymnocladus* and is named *G. Chinensis*, Baillon. Specimens of the pods have been sent to Kew from Fokien, by Mr. F. S. A. Bourne, of Her Majesty's Consular Service. These pods are 3 to 4 inches long and hard and horny in the dried state, but capable of swelling up greatly in water. In China they are used for washing purposes, the outer shell being steeped for two days in water and the liquid resulting from it used as soft soap or dried into hard soap (*Gard. Chron.*, April 21, p. 499). The use of the seed is not stated.

The cultivation of drug-yielding plants seems to form an important feature in the Botanical Gardens at Saharunpur (*Nature*, April 19, p. 588). During the past year *Fraxinus ornus*, *Guaiacum officinale* and *Rheum palmatum*, var. *Tanguticum*, one of the supposed sources of Chinese rhubarb, have been added to the gardens. Dr. Duthie proposes to cultivate either on the hills or at Saharunpur, aconite, aloes, buchu, calumba root, colchicum, digitalis, gentian, jalap, liquorice, scammony, colocynth and others. This will be done with the view of supplying drugs for the use of the medical department, for which extracts of henbane and taraxacum have already been made from plants cultivated in India. It seems that the cost of maintaining these gardens has hitherto much exceeded the income derived from them; it may be hoped, therefore, that this new departure will bring about a different state of things.

Attention has recently been drawn in the United States to the medicinal properties of *Polygonum hydropiperoides*, a plant which Dr. Eberle in his work on 'Materia Medica and Therapeutics' speaks of as the most active and certain of emmenagogues. It was also held in estimation by Professor M. B. Wright, of Cincinnati, who prescribed it with considerable success. The form of administration most in favour appears to be the fluid extract, which is given in doses of 5 to 30 minims three or four times a day mixed with wine or glycerine. The activity of the drug is supposed to be due to the same active principle as previously isolated from *P. Hydropiper*, L., by Dr. C. J. Rademacher, in 1871 (*Pharm. Journ.*, [3], ii., 426). *Polygonum hydropiperoides* is said to have a decided stimulant, even vesicant property, when rubbed into the skin, whence its common name of smartweed. The *American Journal of Pharmacy* gives Michaux as the authority for the species, but according to Gray's 'New Manual of Botany,' that species is not acrid. The plant intended, therefore, is probably *P. hydropiperoides*, Pursh., which is described by Asa Gray under the name of *P. acre*, H.B.K., and differs from the English species, *P. Hydropiper*, in having larger leaves, erect flower spikes, whitish flowers and smooth, shining, sharply triangular achenes.

The results of an examination of the Californian "manroot" (*Megarrhiza Californica*), used by the Indians as a drastic purge in dropsy, was reported recently by Mr. W. M. Young to the Californian College of Pharmacy (*Proceedings*, p. 52). He confirms the presence of very bitter glucosidal principle, called by Heaney (*Pharm. Journ.*, [3], vii., 393) "megarrhizin" and said by him to closely resemble colocynthin, which was found to be purgative in doses of a quarter of a grain. Mr. Young also found another glucoside, resembling saponin, and possessing the power of dilating the pupil; this he has named "megarrhin."

A fluid extract of the flower heads of red clover (*Trifolium pratense*) having been introduced in the United States as a remedy for whooping cough and scrofula, and an infusion as a wash for ill-conditioned ulcers, Mr. Grazer, submitted some flower-heads to analysis. He found two resins (one soluble in alcohol and with a yellow colour in caustic potash solution; the other soluble in ether and with a green colour in caustic ammonia) as well as a peculiar acid principle; but he does not appear to think that there is any principle present to which a special therapeutic action could be attributed.

A singular effect of corrosive sublimate, first observed by Salkowski, has recently been confirmed by Prévost and Trutiger, of Geneva (*Lancet*, April 14, p. 640). They have found that it causes the lime to be removed from the bones to the extent of 2 to 4 or sometimes 8 to 10 per cent. and to be deposited in the cortical substance of the kidneys, so that the kidneys appear almost as if petrified, while the bones, at least in the case of rabbits, become so altered that the epiphyses of the long bones are at length movable on the shaft. This decalcification takes place to the greatest extent when the doses of the poison are such as to cause death in three or four days, but are too small to kill in twenty-four hours.

The alkaloid pelletierine, which has recently been introduced into medical practice as a tænifuge, appears to require caution in its use. A case is mentioned in the *Medical Press and Circular* (April 11, p. 316), in which a dose of 8 grains is said to have caused alarming symptoms. The patient had vomiting and diarrhœa, and the body became cold and exsanguine, and only recovered from the state

of collapse after medical treatment for a hour. It is not stated whether the pure alkaloid or the tannate was used, but it is singular that similar cases have not been reported before, if the symptoms were not due to idiosyncrasy.

In the new volume of the *St. Bartholomew's Hospital Reports*, there is an interesting paper by Dr. Lauder Brunton and Dr. T. Cash, on the influence of various alkaloids and alkaloidal salts in arresting the process of oxidation set up by the vegetable protoplasm of the potato and by blood, as indicated by the degree of coloration produced when tincture of guaiacum was brought into contact with potato infusion or diluted blood to which one of the chemicals had been added. The authors state that in comparative experiments it was observed that oxidation in a potato infusion was diminished most powerfully by strychnine; then by quinine and coniine; next almost equally by morphine, codeine, cinchonine and atropine; next by nicotine, and then by veratrine. Aconitine did not seem to affect the oxidation. On the other hand, caffeine, picrotoxin and digitalin appeared to hasten the oxidation. When blood was used cinchonine showed the greatest power of retarding oxidation, then came veratrine, morphine, quinine, codeine and atropine, whilst strychnia appeared to have much less power than in the case of potato infusion. Of the salts of morphia, the acetate and bimeconate had almost no action, whilst the hydrochlorate and iodide appeared to accelerate oxidation.

Dr. R. Külz has been engaged upon an investigation of laserpitin, the bitter principle found in the root of *Laserpitium latifolium*, popularly known in Germany as "white gentian root," with the object of determining its composition and also whether it is allied to such bitter principles as peucedanin, athamanthin, and ostruthin, occurring in other umbelliferous plants (*Archiv*, xxi., 161). The laserpitin was obtained in large colourless prisms by exhaustion of the finely sliced root with light petroleum spirit, distilling off the greater part of the solvent, and leaving the coloured residual liquid to evaporate spontaneously. The crystals were insoluble in dilute solutions of caustic alkalies and acids, freely soluble in chloroform, ether, benzol, and carbon bisulphide and much less soluble in alcohol; they melted at 118° C., and the mean of a number of analyses corresponded closely with the formula $C_{15}H_{22}O_4$. Laserpitin forms a crystalline compound with acetic acid ($C_{15}H_{22}O_4.C_2H_4O_2$), and acetyl, nitro, and brom derivatives were also obtained. Treated with strong sulphuric acid it is decomposed, with formation of methyl-crotonic acid, and with alcoholic hydrochloric acid the isomeric angelic acid is produced, whilst fusing with caustic potash gives the former, and boiling in a solution of it gives the latter, the other substance formed being a resinous body which has been named "laserol." None of the decomposition products obtained by the author corresponded with those obtained under similar conditions from peucedanin, ostruthin or athamanthin.

The seeds of *Nigella sativa* have again been subjected to a chemical examination, this time by Dr. Pellacani (*Archiv f. exp. Path. und Pharm.*, xvi., 441). The author reports the isolation of two alkaloids, nigelline and connigelline, which resemble the active principles of jaborandi in their physiological action. To the presence of these two alkaloids the therapeutic effects of the seeds, as observed by Dr. Canolle, are to be attributed.

The leaves of four species of cinchona, grown in California, have been submitted to an examination by Mr. Haffenberger, who reports (*Proc. Cal. Coll. Pharm.*, p. 53) that he has obtained an average of 2 per cent. of alkaloid from the leaves of *C. Calisaya*, 1·8 per cent. from those of *C. succirubra*, and 0·66 and 0·70 per cent. from those of *C. officinalis* and a hybrid respectively. In the calisaya leaf the bulk of the alkaloid, 4 per cent., was found in the midrib, and only 0·76 per cent. in the lamina. The alkaloids from this species consisted of quinine, quinidine, cinchonine and cinchonidine, the quinidine constituting about one-half of the whole. These results resemble those obtained in an analysis of cinchona leaves made some years ago by Mr. J. E. Howard (*Pharm. Journ.*, [2], v., 368).

During the past month *Andrographis paniculata* has been offered in the London market for chiretta. The demand for bitters, owing to the scarcity of hops, seems to have led to an increase in the number and quantity of such drugs imported, as many as 906 bags of calumba root having been offered at the last drug sale in London.

More than a ton of Calabar beans were also put up for sale and 41 bales of scammony root, a drug which has lately been scarce and dear and of which it was stated that the exportation had been stopped by the Turkish Government. From some specimens recently received it would appear that boldo is known in Chili as "boldu." This is a lauraceous plant, *Cryptocaryx Peumus*. The leaves are ovate and leathery, whitish below, with an odour resembling that of bay leaves.

For some months past an oil has appeared in the London markets under the name of Japanese cod liver oil. According to the *Oil, Paint and Drug Reporter* (Dec. 20, p. 1353), it is made from various species of fish, and is extracted during the process of treating fish scrap for fertilizing purposes. The reason of its introduction into this country is said to be that it was refined and used in Japan as an illuminating oil before the introduction of petroleum into that country, but that now another market has to be sought for it in consequence of the lower price of that oil. It resembles ordinary cod liver oil in colour and odour, but is said to be more affected by cold. It is put up in cans each containing 2 to 5 gallons.

Alicante saffron has already a bad name in commerce and it seems probable that the misplaced ingenuity of those who manufacture the drug will lead ultimately to the destruction of the trade in it. A new adulteration of this commercial variety of saffron has been described by Dr. J. Biel, in *Pharm. Zeitsch. f. Russland*. It consists of marigold florets (*Calendula officinalis*) coloured with dinitrocresylate of sodium, then impregnated with oil and rolled up lengthwise, and mixed with 4 to 30 per cent. of true saffron. The adulterated saffron colours water yellow and gives an amount of ash equal to that of the true drug. It is detected by imparting to petroleum spirit a lemon-yellow colour, the colouring matter of saffron not being soluble in that liquid. Dinitrocresylate of sodium, giving a colour like that of saffron, being cheap and apparently innocuous, has for some time past been used for colouring liquids.

Herr Hirschsohn has published a paper (*New Remedies*, April, p. 99) in which he speaks favourably of an

antiseptic dressing consisting of an oakum made from old tarred ropes saturated with chloride of zinc. A dressing containing 15 per cent. of zinc chloride is prepared by boiling the thoroughly carded oakum for half an hour with ten or fifteen times its weight of a 10 per cent. solution of zinc chloride in a closed kettle; afterwards pressing it between two hinged boards, drying it in thin layers and carding it; or it may be preserved uncarded in waxed paper. If a 10 per cent. dressing be required, a 7 per cent. solution of the dry salt is used, and for a 5 per cent. dressing the strength of the solution is reduced to 3½ per cent. It is pointed out by the editor of *New Remedies* that as oakum would often contain too much tar, ordinary tow might be substituted with advantage.

A comparatively new line of investigation in pharmacy has been taken by Mr. W. E. Saunders, who gives in the *American Journal of Pharmacy* (April, p. 161) a description of insects injurious to drugs. Although an imperfect communication, inasmuch as the descriptions are not sufficient for the identification of the insects, it yet contains some valuable practical remarks. He states that the little brown beetle so common in the cummin seed and many other drugs, while they become uncomfortable, seem to thrive just as well with camphor as without it; the little beetle which feeds on cantharides, while it dislikes camphor, is not killed by it. The vapour of chloroform, however, rapidly kills them.

In the last number of the *Journal für praktische Chemie* (vol. xxvii., p. 231) Herr Heinrich Struve publishes some interesting results obtained in the dialysis of various animal and vegetable substances containing albumen, using an animal membrane that had been treated with ether as a septum and chloroform water or ether as the dialysing liquid. The antiseptic properties of the chloroform were found to be effectual in preventing decomposition, so that the operation could be prolonged during a considerable time without change taking place. Amongst other substances experimented upon was the milk of women and cows, and it was found that by the use of chloroform water in the dialysing operation the whole of the albuminoid substances dissolved in the milk could be separated from undissolved casein and butter. A portion of the undissolved casein constituted the enveloping material of the milk globules and this separated with the cream, whilst the other part remained in the "skim" milk. Herr Struve's observations and experiments have led him to the conclusion that the digestibility of any particular milk is in inverse relation to the quantity of this undissolved casein which is not taken up in the formation of the milk-globule envelope, and he, therefore, endorses the recommendation of Dr. Biedent that in the artificial nourishment of infants, at first, only the cream of cows' milk should be used.

In a paper read before the Applied Chemistry and Physics Section of the Society of Arts (*Journ. Soc. Arts*, April 20, p. 545), Professor R. W. Atkinson called attention to the subject of the formation of diastase from grain by the action of moulds, as illustrated in the production of the Japanese fermented drink, "saké." The first steps especially of the manufacture as described, which include the preparation of the diastatic material, appear full of interest to the pharmacist at a time when preparations containing diastase and other ferments are in such great demand. The preparation of *koji* diastase differs in a very marked manner from the malting process. In the case of malt the degradation of albuminoid matter in the barley grain, which results in the formation of diastase, is the effect of a vital process or germination, whilst in the case of *koji*, the first step is to destroy all vitality in the rice grain by removing the husk and embryo and then steaming it. The rice after this treatment is placed in contact with growing mould, the mycelium of which penetrates the substance of the grain and there acts upon the starch and nitrogenous matter, liberating carbonic acid and producing certain soluble nitrogenous bodies, which are capable of converting starch jelly into sugar and dextrin. After the rice has been mixed with the fungus spores it is spread out on trays, which are arranged in underground chambers, kept at a temperature between 79° and 84° F., the heat developed during the growth of the fungus being ample for this purpose. The action does not give rise to the evolution of any ammonia, possibly because the fructification of the mould is avoided except when a fresh supply of spores is required. In the freshly finished *koji*, the soft and swollen grains of rice appear bound together into lumps by fine white silky filaments. Water at a temperature of 113° F. almost entirely dissolves it, leaving only the cellulose skeleton of the grain and mycelium. Treated with cold water a considerable portion dissolves, forming when filtered a golden yellow solution possessing in a marked degree the property of converting starch into sugar. It is worthy of notice that the conversion does not, as in the case of malt, stop short at the production of maltose, but that hydration of the maltose readily takes place, with the formation of glucose. Professor Atkinson is unable to give any very definite information as to the nature of the mould employed. The powder sown is of a yellowish-green colour, and appears to be a mixture of spores, principally of species of *Penicillium* and *Mucor*; this is confirmed by the fact that it is used also in the production of yeast, and that it sometimes gives rise to the butyric fermentation.

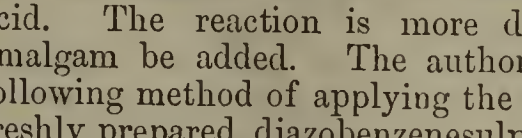
In a recent valuable communication on the salts of caffeine (see before, p. 103) M. Tanret cast a doubt upon the existence of true saline compounds of caffeine with the organic acids, and especially disputed the formation of an acetate, valerianate, citrate or lactate. As this was contradictory of some published experience, Professor Schmidt, of Halle, requested Dr. H. Biedermann to work out the subject, and in the current number of the *Archiv der Pharmacie* there is a paper containing descriptions and analyses of a number of definite salts of caffeine, including the formate, acetate, butyrate, and valerianate, as well as the hydrochlorate, hydrobromate, nitrate, sulphate, aurochloride and platinochloride. According to Professor Schmidt the salts may, as a rule, be obtained by dissolving the caffeine, with a moderate amount of heat, in the respective concentrated acids; upon cooling the salts usually crystallize out, but if not, crystals of the salts may be obtained by keeping the solutions over chloride of calcium. It is admitted, however, that these salts are all very unstable, splitting up when brought into contact with water or alcohol, and that they are therefore quite unsuited for medicinal use.

The essential oil of angelica root has been the subject of an investigation by M. L. Naudin: He states (*Comptes Rendus*, xcvi., 1152) that when obtained by distillation in the vapour of water it is a mobile liquid, sp. gr. at 0°, 0·875, with an odour of angelica much less delicate than that possessed by oil from the seeds. When freshly distilled it is colourless, but it becomes yellow if exposed to the light. It absorbs oxygen and resinifies slowly. Experiments showed that the oil of angelica root is composed of a single terpenic carbide, boiling at 166° C., and with a density of 0·870, which M. Naudin calls "β-terebangelene," mixed in the commercial oil with various polymers, formed by the action of heat during the distillation and augmenting in quantity with the age of the oil. The essential oil of angelica seeds also consists of a single carbide, "terebangelene," boiling at 175° C., and much more alterable by heat than its isomer from the roots.

In the production of œnanthol from castor oil by distillation, Stanck found that a highly elastic sticky substance resembling caoutchouc remained behind in the retort. Professor A. R. Leeds (*Ber.*, xvi., 290) has made a further examination of this substance, which he obtained by distilling castor oil *in vacuo* until all the œnanthol had passed over. On washing with ether and alcohol the stickiness and elasticity disappeared, and on analysis the formula of the substance was found to be $C_{42}H_{68}O_5$, which agreed with that obtained by Stanck. The substance thus purified was saponified with potassium hydrate and the filtrate precipitated by hydrochloric acid, by which means a light brown oil was obtained, which was insoluble in water and only slightly soluble in alcohol and ether. When purified from ether its formula was found to be $C_{36}H_{68}O_7$. The solution from which this substance had been precipitated contained no glycerin. The oil was fractionally distilled, and the portions distilling at 120°, 180° and 220° C., collected. These oils formed no salts with either potassium or sodium. Thus the experiments of the author do not confirm the view of the constitution of the substance taken by Stanck, namely, that it was an acryloxy-compound which was capable of yielding pyroricinic acid ($C_{36}H_{60}O_3$) and acrolein.

The vapour density of sulphuryl chloride (SO_2Cl_2) has been studied by Messrs. Heumann and Köchlin (*Ber.*, xvi., 602) with extremely interesting results. These observers find that at the temperature of boiling aniline (184° C.) the vapour density is normal (4·5); but at the boiling point of sulphur (442° C.) the vapour density is only 2·36, that is to say, that at this temperature sulphuryl chloride is dissociated into sulphur dioxide and free chlorine, thus, $SO_2Cl_2 = SO_2 + Cl_2$. These gases were detected and separated by passing the mixture over lead peroxide, by which means the sulphur dioxide was retained as lead sulphate, and the chlorine which passed on was detected by the liberation of iodine from potassium iodide. The same observers have determined the vapour density of chlorosulphonic acid ($SO_2.OH.Cl$), a substance possessing interest from the fact that its discovery by Williamson led to the present view of the constitution of sulphuric acid as a compound of two hydroxyl groups with one molecule of sulphur dioxide. Williams (*Journ. Chem. Soc.*, vii., 304) had previously shown that the vapour density of this substance at 216° C. was rather more than half the normal calculated density, and he accounted for this by supposing that the compound was at this temperature dissociated into hydrochloric acid and sulphur trioxide, thus, $SO_2.OH.Cl = SO_3 + HCl$. Heumann and Köchlin have confirmed the correctness of the vapour density determination, but consider that the explanation is not in harmony with the general behaviour of chlorosulphonic acid. A determination of the vapour density at 442° C. gave 2·09 instead of the normal 4·04, which these observers explain by the following decomposition:— $2(SO_2.OH.Cl) = SO_2 + Cl_2 + SO_3 + H_2O$, and they further consider that at 216° C. this same decomposition occurs, but at that temperature it is only partial. This explanation appears to be in harmony with previous observations.

A new synthesis of anthracene has been made by Messrs. Anschütz and Eltzbacher (*Ber.*, xvi., 623) by the action of aluminium chloride upon a mixture of benzene and acetylene tetrabromide, thus, $2C_6H_6 + C_2H_2Br_4 = C_{14}H_{10} + 4HBr$. The reaction may be represented as the removal of four atoms of hydrogen from the benzene by four atoms of bromine in the acetylene tetrabromide, the two benzene residues, $2(C_6H_4)$, being then held together by 2(CH) constituting anthracene,



A new and delicate test for aldehydes has been discovered by Messrs. Penzoldt and Fischer (*Ber.*, xvi., 657), which is based upon the fact than in presence of a caustic alkali, aldehydes give a violet-red colour with an alkaline solution of diazobenzenesulphonic acid. The reaction is more delicate if sodium amalgam be added. The authors recommend the following method of applying the test. One part of freshly prepared diazobenzenesulphonic acid is dissolved in 60 parts of cold water rendered alkaline with caustic soda. To this solution is added the substance to be tested for an aldehyde, previously mixed with dilute caustic soda solution. A small fragment of sodium amalgam is added, and the liquid allowed to stand for about twenty minutes. If an aldehyde is present an intense violet-red coloration is produced. This reaction is easily given by a solution containing 1 part of oil of bitter almonds (benzoic aldehyde) in 3000, and has been obtained by the authors with acetic, valeric, and œnanthylic aldehydes, also with furfurol and glyoxal. Chloral does not give the reaction. Acetone and acetic ether give a red colour, but without the characteristic violet tint which is yielded by an aldehyde. The reaction is not given by phenol, resorcin or pyrocatechin. It is somewhat remarkable to note that the reaction is given by grape sugar, which does not give the reaction for an aldehyde with other reagents for this substance, as sodium bisulphite or "fuchsin sulphite." The present test is said to be more delicate than this latter reagent, which is a solution of fuchsin decolorized by sulphurous acid. The authors consider that this reaction points to the fact that grape sugar is probably a ketone-alcohol, as has been suggested by other observers. The composition of the violet-red colouring matter is unknown.

It is well known that when pure zinc is mixed with sulphuric acid and water very little hydrogen is evolved, but upon the addition of a small quantity of platinum perchloride the action proceeds energetically. Ballo has shown that similarly the metal magnesium is incapable of decomposing pure water,

but on the addition of a trace of platinum perchloride hydrogen is copiously given off and hydroxide of magnesia deposited. The observer of this reaction recommends (*Ber.*, xvi., 694) the use of platinized magnesium as a general reducing agent. A dilute alcoholic solution of nitrobenzene was treated with a drop of platinum perchloride and a small piece of metallic magnesium. Hydrogen was rapidly disengaged and hydroxide of magnesia precipitated. The solution after filtering gave the usual reaction for aniline, and the nitrobenzene was wholly reduced. This method of testing for nitrobenzol has this advantage over the ordinary method with an acid and zinc or iron, that the aniline is liberated in the free state and can at once be detected in the filtrate without the addition of potash and subsequent filtration as is necessary in the latter method.

In considering the analogies that exist in one or two instances between selective absorption of light and selective absorption of radiant heat, Professor Tyndall has been led to discover experimentally "a hitherto unobserved resemblance between carbonic acid and bisulphide of carbon" (*Chem. News*, April 13, p. 169). As is well known, when by means of an electric current a metal is volatilized and submitted to spectrum analysis, the "reversal" of the bright band of the incandescent vapour is commonly observed, this being due to the absorption of the rays emitted by the vapour by the partially cooled envelope of its own substance which surrounds it. The author finds that an analogous phenomenon is manifested in respect to radiant heat in the case of hot carbonic acid gas and cold carbon bisulphide. Carbon bisulphide is the most diathermous body known for all ordinary sources of radiant heat, a thin layer of it transmitting 90 per cent. of the radiation from hydrogen gas; but under the same conditions it transmits only 25 per cent. of the radiation from carbonic acid gas, the remaining 75 per cent. being absorbed. This result goes to confirm the accepted atomic structure of these bodies.

Rather more than five years since Messrs. Cailletet and Pictet, working independently, demonstrated the possibility of liquefying oxygen and nitrogen, but the conditions under which the experiments were performed precluded more than a momentary evidence of their success. It remained still to effect the liquefaction under conditions which would allow of the products being examined more minutely, and this is now reported to have been accomplished by Messrs. Wroblewski and Olszewski (*Comptes Rendus*, xcvi., 1140), who have availed themselves of the intense cold produced by the vaporization in a vacuum of liquid ethylene, which under the pressure of one atmosphere boils at a temperature of about $-105°$ C. The critical point of oxygen occurs, however, at a much lower temperature than this. In a series of experiments the gas was found to commence to liquefy at a temperature of $-131{\cdot}6°$ C. under a pressure of 26·5 atmospheres; at $-133{\cdot}4°$ C. under 24·8 atmospheres, and at $-135{\cdot}8°$ C. under 22·5 atmospheres. Liquid oxygen is described as being colourless and transparent like carbonic acid, very mobile, and forming a very distinct meniscus. Nitrogen is said also to form a colourless liquid, with a perceptible meniscus. The experimenters, in addition, succeeded in freezing bisulphide of carbon at a temperature of about $-116°$ C.; whilst alcohol became viscous at about $-129°$ C., and solidified at about $-130{\cdot}5°$ C., forming a white substance.

INDOPHENOL.*

BY ALBERT H. SAMUEL.

Indophenol is the name given by Mr. Horace Koechlin, of the Lörrach Print Works, Baden, to a new colouring matter, the formation of which he has discovered in the course of a series of experimental researches, in conjunction with Dr. Otto Witt, on the action of nitroso compounds on phenols.

Dr. Witt has published from time to time his researches on the combinations and variations that could be formed, resulting in the production of new blue and violet colouring matters, which are most interesting to those who desire to see the various steps which have led up to the discovery of these new substances.

Dr. Raphael Meldola, an accomplished English chemist, nearly three years ago published an account also of his own personal researches in a similar direction quite independently of Dr. Witt, resulting in forming new compounds of brilliant *violet* colouring matters, and he would seem to have been on the verge of eliminating indophenol, as he worked in pretty nearly the same direction as that which led to the successful discovery accidentally made subsequently by Mr. Horace Koechlin, and it is to the skill and perseverance of Mr. Koechlin that the full credit of this discovery is to be awarded, as well as the manner of practically applying same in printing and dyeing.

Mr. Horace Koechlin and Dr. Otto Witt were prosecuting their researches in the direction of endeavouring to produce a *violet* dye from the action of nitroso-dimethyl-aniline hydrochloride upon α-naphthol.

There are two isomeric modifications of naphthol known to chemists as α and β, and distinguished from each other by the fact that α-naphthol gives a violet coloration when chloride of lime is added to its aqueous solution and β-napthol gives no such coloration with chloride of lime.

Mr. Horace Koechlin's idea was to print a mixture of the ingredients on the fabric in the usual *acid* solution. By accident, on this occasion, however, the solution used, instead of being *acid*, happened to be an *alkaline* one, and Mr. Koechlin at once observed that instead of obtaining the expected violet colour, a *blue* colour was the result. This was so unexpected that he was induced to follow up this striking modification, and after making further experiments on other phenols, he found that this series of aromatic alcohols or phenols are all more or less capable of forming *blue* colouring matters when acted upon by nitroso compounds in an *alkaline* solution, and as it was thought by Mr. Koechlin that these substances might be used as substitutes for the natural production indigo, they received the generic name "indophenols," there being seemingly no other reason for the prefix indo, but this one.

Immediately following these interesting and important results, Mr. Horace Koechlin, in Lörrach (Baden), in conjunction with Dr. Otto Witt, of Mullhouse (Alsace), took out German letters patent for the manufacture of these new blue colouring matters, in which they describe two distinct methods of preparing the same, viz.:—

First Method.

By the action of tertiary aromatic nitrosamines on an alkaline or ammoniacal solution of one of the phenols. The reaction is a very slow one, but can be greatly accelerated by introducing into the mixture a reducing agent, such as zinc in powder, glucose, etc.

The nitroso compound selected by the patentees was nitroso-dimethyl-aniline.

As these names do not convey a clear idea of the process to those who are not conversant with these complex substitution products, it may be as well, perhaps, if I endeavour to explain what is the chemical nature of a tertiary aromatic nitrosamine.

An *amine* is a name given to a class of compounds de-

* Read before the Liverpool Chemists' Association.

rived from ammonia by substitution of alcohol radicals for one or more of the hydrogen atoms in same.

Thus ammonia is chemically known as—

$$NH_3 \text{ or } N\begin{cases} H \\ H \\ H \end{cases}$$

By substituting the alcohol radical *methyl* (CH_3) for one of the atoms of hydrogen we get—

$$N\begin{cases} CH_3 \\ H \\ H \end{cases} \text{ or } CH_5N - \text{or methyl-}\textit{amine}.$$

if two atoms of the H are replaced by methyl (CH_3), we get—

$$N\begin{cases} CH_3 \\ CH_3 \\ H \end{cases} \text{ or } C_2H_7N - \text{dimethyl-}\textit{amine}$$

and if the whole three atoms of H are replaced—

$$N\begin{cases} CH_3 \\ CH_3 \\ CH_3 \end{cases} \text{ or } C_3H_9N_3 - \text{or trimethyl-}\textit{amine}$$

Now aniline may also be considered as an *amine*, in which one of the H atoms is replaced by the alcohol radical phenyl (C_6H_5).

Thus:—

$$N\begin{cases} C_6H_5 \\ H \\ H \end{cases} = C_6H_7N - \text{aniline}$$

as above explained *dimethyl-aniline* would then be—

$$N\begin{cases} C_6H_5 \\ CH_3 \\ CH_3 \end{cases} \text{ or } C_8H_{11}N$$

and nitroso-dimethyl aniline—

$$N\begin{cases} C_6H_4NO \\ CH_3 \\ CH_3 \end{cases} = C_8H_{10}N,NO$$

nitroso-dimethyl aniline is therefore a *nitrosamine*.

Now I have stated that indophenol is prepared by the action of a tertiary aromatic nitrosamine on a phenol in an alkaline solution, and to those who are not acquainted with these phrases the words ' tertiary aromatic" may also need explanation.

The series of organic compounds in question is called by chemists *aromatic*, from the fact that many of its members occur in essential oils, balsams, gum resins, etc., all possessing an *aromatic odour*.

I have already shown the constitution of an amine. Now, if only *one* of the atoms is replaced by a radical, it is called a *primary* amine; if *two*, a *secondary* amine, and if all three atoms are replaced by radicals the compound resulting is called a *tertiary* amine.

You are, I hope, now acquainted with the chemical constitution of a tertiary aromatic nitrosamine. The chemical constitution of the phenols will not, I think, nced any explanation, as they are, comparatively, compounds whose chemical formula are simple.

The phenols mentioned by Koechlin and Witt in their patents are ordinary phenol, resorcin, orcin, and the two naphthols already described.

The patentees wish it to be known that their new dyes, the indophenols, differ materially from those previously discovered by Dr. Meldola in his investigations, the latter being formed in *acidulated* solutions with *boiling*, whereas the *indophenols* are produced at the *ordinary* temperature and in *alkaline* solution.

The *second* method employed by the patentees to produce indophenol is as follows:—

First, to reduce the nitrosamine and then to oxidize it in an alkaline solution of the phenol.

For this purpose they dissolved acidulated nitroso-dimethyl-aniline in water and reduced it with zinc powder to the form of paramido-dimethyl-aniline by agitation at a temperature of from 45° to 50° C. The clear liquid is then separated from the surplus zinc and zinc compounds and mixed with a mixture of α-naphthol and oxidizing agents, such as bichromate potass and soda lye. When the contents are completely mixed a weak solution of acid is slowly added and the dye is formed immediately, and is completely precipitated.

With naphthol the dye obtained is *pure blue*, with phenol it is more of a greenish shade, and it varies according to the phenol employed.

Indophenol in powder, as met with in commerce, is formed of the sodium salts. It has both acid and basic properties. Its compounds with acids are light dirty coloured, and soluble in water. Its metallic salts, on the contrary, are bright blue coloured substances and insoluble in water. Indophenol dissolves in alcohol with a blue colour, but is insoluble in water. It is partially soluble in organic acids, and also in *dilute* inorganic acids, but *concentrated* inorganic acids destroy it. Reducing agents transform it into a comparatively colourless compound, called *leuco*-indophenol or white indophenol, a reaction which occurs in other colouring matters. The colour is immediately reproduced by an oxidizing agent and even by the oxygen of the atmosphere.

The *leuco*-indophenol is *indophenol* reduced by a salt of tin in an acid solution. This form of indophenol is a very important one to the calico printers, as it enables them to print with indophenol in combination with other colours (as is constantly necessary in printing fabrics) without the same becoming mixed, and the colours are reproduced subsequently by oxidation and steaming.

The formulæ for printing are given by Mr. Koechlin and were published in a recent number of the *Chemical News*. In conversing with those printers who are using indophenol, they state there are several difficulties yet to be overcome if the substance is to obtain any extensive use as a substitute for indigo and other *blues*. They complain of its being of too delicate a nature, for one thing, that is to say, the steaming must be dry and not exceed half an hour, which will not suit the other colours that are printed with it, and, consequently its use in combination with other colours is much limited on this account. Again, it is not a fast colour in comparison with indigo, and stands washing only moderately, although it has been reported as being unaffected by sunlight or washing.

As to its present practical application in England the information on these points I have been able to glean shows that its use at present is decidedly limited, that it is not applicable practically for dyeing purposes, and that where used in printing it can only be used with safety by itself and not in combination, which limits its application still further. I am informed, however, that it is largely used in the extensive printing establishments on the continent, namely, at Mulhouse, Alsace, and at Elberfeld, in Prussia. No doubt it would come into equally extensive use here, if our practical men were more intimately acquainted with it, as naturally our continental neighbours must have a great advantage in a knowledge of applying it, inasmuch as the patentees are on the spot and are no doubt interested in it, not only as their own discovery but also as a personal commercial success.

The patentees claim a third method of producing indophenol, namely by forming the dye itself on the material to be printed upon.

They describe *three* ways of effecting this:—

1st. They steep the material in a naphthol salt, and after drying, print with a concentrated solution of nitroso-dimethylaniline hydrochloride, in an alkaline solution in which are mixed some reducing agents, such as glucose, zinc, etc. The colour is developed after the usual steaming.

2nd. The material is first steeped in a solution of the reducing agent, and then printed with a concentrated solution of nitrosodimethylaniline and naphthol salt and steaming.

3rd. Bleached calicoes can be printed without previous preparation with a concentrated solution of amido-dimethylaniline and naphthol salt, steamed and then run through a solution of potass. bichromate and washed

The full development of the colour comes out in the bicromate bath.

The patentees claim that there are two special characteristics in which indophenol differs from the violet and other colours obtained by Dr. Meldola and others in prior researches, namely, that the latter are all more or less *fluorescent* and unchanged or dissolved by acids, whereas in the indophenol blues there is an entire absence of fluorescence and they are extremely sensitive to acids.

As already stated, these new dyes, indophenols, are soluble in weak acid solutions, but decompose after a short time, more quickly the higher the temperature is, and form brown substances, the chemical constitution of which is little known.

As regards the chemical constitution of indophenol the patentees state that at present they are only able to express their conjectures, supported by experimental evidence. They find, they say, unexpected difficulties in the way, and therefore their analytical data are incomplete.

They entertain, however, the following formula of indophenol as being probable:—

Indophenol produced by Action of a Tertiary Aromatic Nitrosamine on Phenol.

$$\left.\begin{matrix}CH_3\\ NCH_3\\ NO\end{matrix}\right| C_6H_4 + C_6H_5OH$$

Nitrosodimethylaniline. + Phenol.

$$= C_{14}H_{14}N_2O + H_2O$$

Indophenol (from phenol) Water.

If naphthol instead of phenol be used the formula must be altered accordingly.

Indophenol produced by Action of Oxidation of a Reduced Nitrosamine on Naphthol.

$$\left.\begin{matrix}CH_3\\ NCH_3\\ NH_2\end{matrix}\right| C_6H_4 + C_{10}H_7OH + 2O$$

Dimethylparapheny-lendiamine (reduced nitrosamine). Naphthol. Oxygen.

$$= C_{18}H_{16}N_2O + 2H_2O$$

Indophenol (from naphthol). Water.

There seems to be an impression that this new dye indophenol, and the substance known as artificial indigo, are one and the same thing. This of course is not so.

Artificial indigo is the result of an elaborate series of researches commenced, I believed, by Adolph Baeyer more than twenty years ago. He prepared it from cinnamic acid, which he treated in the first place with nitric acid, forming ortho-nitro cinnamic acid. In second place he converted the latter into the dibromide, and third, he further treated the latter with caustic soda, forming ortho-nitrophenyl propiolic acid, and by a reducing agent, converted the latter into *indigotin*, which is the pure colouring matter of indigo.

The calico printers use this ortho-nitrophenyl propiolic acid in the form of a paste, of which I have also a specimen on the table, which is printed, I understand, on the cloth with an alkali and reducing agent such as grape sugar, and subsequently steaming the fabric to reproduce the colour.

With grape sugar, however, the process of reducing was found not to work well as it required *heat*, and there was the risk of the production changing to indigo *white*, and it was found difficult to stop this reaction at the right moment.

To obviate these difficulties, Dr. Caro, of Mannheim, proposed as the oxidizing agent, xanthate of soda, $NaC_2H_5COS_2$. Using this the reaction can be effected in the cold, and thus the risk of destroying the colour can be avoided.

My personal inquiries lead me to state that neither artificial indigo nor indophenol have as yet found much favour with our English printers, and for dyeing purposes they both seem at present to be *hors de combat* altogether.

Both substances, however, are capable of improved developments, and just as alizarine has now almost superseded the use of the natural product *madder*, so it may be quite possible in a not very distant future to see these new artificial blues becoming formidable competitors with the natural product indigo, and when we recollect that from statistics obtained by Dr. Roscoe about eighteen months ago, he showed that the saving effected by the use of alizarine instead of madder is over £4,000,000 per annum, we can appreciate the necessity of our scientific and practical chemists leaving no stone unturned in the further prosecution for improved results on these blues, with a view of ultimately having their labours crowned with a similar success.

Germany and France at present have considerable advantages over us, in the facilities and financial encouragement given to their chemists by their governments, in supporting their chemical researches, and until this state of things is remedied in England, and also our patent laws remodelled, we must expect to see ourselves constantly outstripped in the race of discovery of these new chemical developments, and reconcile ourselves to the *un*pleasant fact that although we supply the raw material, we are forced to be in the main simply consumers of these dyes, leaving the field of production, and the consequent commercial benefits derived therefrom, in the hands of our continental neighbours.

SALICYLIC ACID AS A REMEDY FOR CORNS.

Dr. Traill Green, writing to the *Medical and Surgical Reporter*, speaks highly of the results obtained in the treatment of hard and soft corns with salicylic acid. He has adopted a formula recommended by Mr. Gezou, which is as follows:—

"℞ Salicylic acid	30 parts.
Ext. cannabis indicæ	5 parts.
Collodion	240 parts.

Dr. Green says:—"The collodion fixes the acid on the diseased part, and gives speedy relief by protecting it from friction. The cannabis indica acts as an anodyne, and the acid reduces and loosens the corn, so that it comes off in four or five days, adhering to the collodion. The remedy is applied with a camel's hair pencil, and if the corn is not well cured, the application may be repeated. In four or five days the patient should use a warm foot-bath and rub off the collodion. If any portion of the corn remains the acid should be applied again, and the treatment continued until the whole of the corn has disappeared. The skin will be soft and smooth, as in the healthy state.

"The mixture dries immediately, and does not prevent for a moment the use of the stocking.

"I have used salicylic acid in the treatment of bunions with like good results.

"Collodion as found in the shops makes a good mixture, but I have found a flexible collodion preferable, as it makes, with the other ingredients of the remedy, a denser fluid. The extract of cannabis should be the solid extract.

"I am sure no remedy has ever been proposed which is so useful in those painful affections of the feet as salicylic acid."

OIL OF GAULTHERIA.*

W. P. Underhill, who has distilled this oil since 1874, gives the average yield as 10 pounds from a ton of the leaves, the highest yield being 14, and the lowest 9 pounds of oil. The larger yield is obtained when the season is dry. The cost of the leaves delivered at the mill is $1\frac{1}{2}$ cents per pound, and it is very difficult to obtain leaves at that price. Since it will require about 200 pounds of leaves to make 1 pound of oil, the cost of the latter is 3.00 dollars for the leaves alone. The author does not believe that the large sleazy leaves of New Jersey yield more oil than the stiff, hard and brittle leaves of New Hampshire.

* From 'Proc. N. H. Phar. Assoc.,' 1882, p. 34. Reprinted from the *Amer. Jour. of Pharm.*, April, 1883

The Pharmaceutical Journal.

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Communications for the Editorial department of the Journal, books for review, etc. should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

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EXPLOSIVES AND MATERIALS FOR MAKING EXPLOSIVES.

THE opinion that we ventured to express a fortnight since, as to the far-reaching effect of the provisions of the new Explosives Act and the necessity for the exercise of caution by chemists and druggists in the supply of articles capable of being used as materials in the manufacture of explosives, has received confirmation in a letter which has been issued by the Home Office to local authorities, with an instruction to bring the subject matter of it under the notice of all pharmaceutical chemists, chemists and druggists, drysalters, oil and colourmen, and manufacturers of or dealers in chemicals within their districts. The object of this circular is to direct attention to the importance of exercising special and vigilant observation with a view to preventing the acquisition, by persons intending to use them for improper purposes, not only of explosives, but of materials from which, if possessed of a little technical knowledge, they would be able to manufacture explosives. In order to assist in the exercise of the desired observation, a memorandum, drawn up by Colonel MAJENDIE, is appended to the circular, in which it is pointed out that independently of the purchase of explosives specially adapted for blasting, and therefore, generally available for destructive purposes, by persons who may not be reasonably supposed to require them for industrial operations, suspicion should attach to the acquisition in notable quantities of any materials adapted for the making of explosives, if the person seeking to purchase the same is unknown to the seller, or is not known to require such materials for trade or other legitimate purposes. Many of the substances falling within this category are dealt with in the ordinary course of the chemist and druggist's business, as will be seen from the following list of those which are specially enumerated:—Nitric and sulphuric acids, especially in their more concentrated forms, glycerine, potassium and sodium nitrates, chlorates (especially potassium chlorate), picric acid and the picrates, phosphorus, orpiment, iodine, metallic mercury and nitrate of mercury, the last three even in comparatively small quantities. As a stimulant to sharpen the powers of observation it is announced that a reward of £100 will be given to any person (not belonging to the police force) who furnishes information that shall lead to the discovery and conviction of an offender who may be engaged in the illegal manufacture of explosives, provided that the case is one where the Secretary of State is satisfied that the illegal manufacture constituted a serious infraction of the law and was being carried on for an illegal purpose.

Almost simultaneously with the appearance of the circular above referred to, the *London Gazette* contained three Orders in Council, made in accordance with section 43 of the Explosives Act, 1875, which provides that Her Majesty may in this way prohibit the manufacture, *keeping*, importation, conveyance and *sale*, either absolutely or except in pursuance of a licence, or subject to restrictions, of any explosive which may be deemed of so dangerous a character as to require that the Order should be made in the interest of the public safety. The three Orders apply respectively to "stores licensed for mixed explosives," "premises registered for the keeping of mixed explosives" and the keeping of explosives for private use, and with the necessary variations of language they contain practically the same provisions, except that the last-mentioned includes fresh restrictions as to the quantity of explosives that may be kept for private use. The provision most likely to affect some of our readers, and which is common to all three Orders, is that henceforth it will be *unlawful to keep* in any licensed store or premises registered for mixed explosives "any explosive which is *not an authorized explosive* or "which *is an explosive of the fifth (fulminate) class.*" The next provision is that "authorized explosives," other than those of the "fulminate class," with some exceptions in favour of cartridges made with gunpowder and fireworks kept for private use, may not be kept in licensed stores or registered premises or for private use, except in pursuance of a certificate, granted by the chief officer of police or some person authorized by him, that the person holding it is a fit person to keep, during the continuance of the certificate, such explosives as are specified in it.

For the purpose of obtaining a definition of the terms "authorized explosives" and "fifth (fulminate) class," as used in these Orders, it is necessary to refer to an earlier Order in Council, made on the 5th of August, 1875, soon after the passing of the Explosives Act of that year, and for the purpose of completing the information relating to the Act which has already appeared in this Journal and in the Society's Calendar, it may be useful to summarize it briefly. In this Order, for the purposes of the Act, explosives are divided into seven classes, named respectively, (1) "gunpowder," (2) "nitrate mixture," (3) "nitro compounds," (4) "chlorate mixture," (5) "fulminate," (6) "ammunition," and (7) "fireworks." In Class 1 the term "gunpowder" means exclusively the substance ordinarily so-called. The 2nd

or "nitrate mixture class" includes any preparation, other than gunpowder, formed by the mechanical mixture of a nitrate with carbon or any carbonaceous substance not possessed of explosive properties, whether sulphur be added or not, and is represented by "pyrolithe," "pudrolithe" and "poudre saxifragine." Class 3, the "nitro compound class," includes chemical compounds possessed of explosive properties or capable of combining with metals to form an explosive compound, produced by the action of nitric acid, or of a nitrate mixed with sulphuric acid, upon carbonaceous substances. There are two divisions in this class, nitroglycerine being typical of the first, and gun cotton and the picrates of the second. Class 4, the "chlorate mixture class," includes any explosive containing a chlorate. In Class 6, the term "ammunition" means an explosive of any of the foregoing classes or of the "fulminate" class, when enclosed in any case or contrivance, or otherwise adapted or prepared so as to be used as a cartridge or charge for small arms, cannon or other weapon, or for blasting, or as a safety or other fuze, a fog signal, percussion cap, etc. Class 7, the "firework class," comprises firework composition and manufactured fireworks, including coloured fires.

The foregoing six classes constitute the "authorized explosives" which it will be lawful under the terms of the Orders just made to keep in "licensed stores," "registered premises," and for private use, to the extent specified in the permissive certificate. The 5th, or fulminate class, which, as well as unauthorized explosives, it will be *illegal to keep*, is thus defined. The term "fulminate" means any chemical compound or mechanical mixture, whether included in the other classes or not, which from its susceptibility to detonation is suitable for employment in percussion caps or other appliances for developing detonation, or which, from its extreme sensibility to explosion or its great instability, is especially dangerous. The class consists of two divisions, the first of which includes such compounds as the fulminates of silver and mercury, and preparations of them; any preparation consisting of a mixture of a chlorate with phosphorus, or certain descriptions of phosphorus compounds, with or without carbonaceous matter; and any preparation consisting of a mixture of a chlorate with sulphur, or with a sulphuret, with or without carbonaceous matter. The second division comprises such substances as the chloride and the iodide of nitrogen, fulminating gold and silver, diazobenzol and the nitrate of diazobenzol.

It only remains to add that under the Explosives Act the local authorities have considerable powers of search and seizure, section 73 giving power to search for ingredients of an explosive as well as the explosive itself. Further, section 23 imposes upon the occupiers of stores and registered premises the obligation of taking all due precautions for preventing unauthorized persons having access to the premises.

THE NORTH BRITISH BRANCH.

On another page will be found an account of the proceedings at the Annual Meeting of the North British Branch of the Pharmaceutical Society of Great Britain, which was held in Edinburgh, on Tuesday last. The Annual Report presented by the executive of the Branch on that occasion shows that under Mr. Alexander Napier's presidency the operations of the Pharmaceutical Society in the North have been carried on with vigour and efficiency, and with results that furnish good ground for congratulation. Especially has this been the case with respect to the Evening Meetings, the past session having been remarkable for the number of interesting and valuable papers brought forward. The Library and Museum have been augmented, and the figures quoted in the Report show that their value is becoming increasingly appreciated by students, upwards of fifteen hundred persons having visited the Museum during the year, and the Library having been well used. For several years past the executive of the North British Branch has endeavoured to meet one of the principal difficulties attending pharmaceutical education in the provinces in a practical way, by making arrangements for enabling students to attend regular courses of lectures on scientific subjects allied to pharmacy upon special terms. This privilege has again been secured during the past year, and the Report specially states that the students who availed themselves of it have shown, by the position they have taken in the classes that they are at least equal to the other students with whom they have been associated.

In one respect the proceedings on Tuesday last presented a novel feature, namely, in relation to the election of the Council which is to conduct the business of the North British Branch during the next twelve months. In previous years this body has consisted of fifteen members; but in accordance with the report of a committee, appointed to inquire into the rules and precedents which have hitherto regulated the election and proceedings of the Council, the voting papers issued this year contained an intimation that it had been decided to increase the number to twenty-one, of whom fourteen would retire annually. This step has been taken with the view of securing a fuller representation of the provinces, and it will be seen by a reference to the list of gentlemen elected that the object has been fairly well attained.

The unanimity with which the services of the retiring President and other officers were recognized was equally gratifying and well deserved. In its new President the Branch will have the advantage of the services of a gentleman well acquainted with the business, Mr. Nesbit having just served a term of office as Vice-President, whilst the gentleman who succeeds him in that position bears a name which is already honourably associated with the history of the Society.

BOTANICAL LECTURES AND PRACTICAL DEMONSTRATIONS AT THE GARDENS OF THE ROYAL BOTANIC SOCIETY.

It will be noticed by reference to the advertisement of the School of Pharmacy of Great Britain in the present number of this Journal, that Professor Bentley will commence his Course of Lectures and Demonstrations on Systematic and Practical Botany, at the Gardens of the Royal Botanic Society, in Regent's Park, on Saturday morning next, May 5, at 8 o'clock. The lectures will be continued on the succeeding Friday and Saturday mornings, at the same hour, till the end of July.

It may be useful to call the attention of Members and Associates of the Pharmaceutical Society who have not yet paid their subscriptions for the current year to the official notice that the Secretary is unable to receive subscriptions after Monday next.

* * *

On Tuesday evening, the Council of the North British Branch, and their friends, according to an annual custom, met at dinner in the Windsor Hotel, Edinburgh, the company numbering about forty. Mr. Nesbit presided, and Mr. Henry Bellyse Baildon acted as croupier, and the dinner appears to have been a decided success.

* * *

The statement that the fire by which the Parliament House of Quebec has been destroyed owed its origin to imperfect electric light fittings, has elicited a letter to the *National Zeitung*, from Dr. Werner Siemens, of Berlin, containing a timely warning as to electricity used for lighting purposes becoming a source of danger from fire. Passing by the fact that the steam or gas engines necessary for the production of the electric current may have been the cause of this fire, he points out that the special apparatus requisite for electric lighting is quite capable of originating a conflagration unless constructed with the greatest care and knowledge. If the calibre of the wires has been wrongly calculated for the current, they may become red hot; whilst the lamps themselves, if improperly fixed, may become a source of danger. Dr. Siemens alleges, what appears very probable, that numerous companies now engaged in the extension of electric lighting do not possess the necessary knowledge or experience, and, in aiming to make electric light as cheap as possible, are overstepping the limits of safety. But he is of opinion that when proper precautions are taken, electricity is much less dangerous than any other mode of illumination.

* * *

The Committee of the International Pharmaceutical Exhibition, to be held in Vienna in August next, has issued a notice that it has taken the necessary steps to secure for all foreign firms the admission into the country of goods to be exhibited free of duty, and their return carriage free of cost. In order also to meet the wishes of intending American exhibitors it has been decided to extend the time for applications from extra-European countries to May. As the forthcoming exhibition will be the first pharmaceutical exhibition of any kind that has been held in Austria, it is naturally exciting considerable attention. It seems, however, almost a pity, in view of the international character which it is desired to give to it, that the notices are sent out written in the German characters that are as a rule so unfamiliar and perplexing to natives of other countries.

* * *

A circular has been issued, signed by the President and Treasurer of the American Pharmaceutical Association and the Presidents of the Pharmaceutical Associations of twenty-two States, calling a meeting of the retail druggists of the United States for the purpose of organizing a national convention, having for its object "to discuss and take action upon the many and growing evils that affect the retail trade." It is not intended that this organization shall at all interfere with the functions of the American Pharmaceutical Association, but work in harmony with it, and it is proposed to hold the meeting in Washington, D.C., on the day previous to the meeting of that Association in September next.

* * *

At a recent meeting of the Société de Pharmacie, convened specially to consider a report which was intended to serve as a preliminary chapter to the forthcoming edition of the Codex, it was decided that instead of attempting to define a tablespoonful as a measure of weight or of volume, it would be preferable to propose to medical men to agree that when they prescribe a tablespoonful they are to be understood to order a quantity equal to fifteen grams of distilled water.

* * *

At the same meeting the size of the normal *compte-goutte* was defined that the diameter of the tube at the point from which the drop falls should measure three millimetres exactly. An opinion was also expressed that the practice of measuring certain very volatile liquids by drops should be abandoned.

* * *

According to a Parliamentary paper issued last week the number of births registered in England and Wales during the year 1882 was—males, 452,829; females, 436,111: total, 888,940. The number of deaths registered during the same time was—males, 266,034; females, 250,749: total, 516,783. The total population, estimated to the middle of 1882, was 26,406,820.

* * *

An inquest was held at Dulwich, on the 20th inst., on the body of Mr. William Leatham Andrews, Pharmaceutical Chemist, who had been found dead in his shop, having apparently just returned from a walk. The medical evidence attributed the death to rupture and diffusion of blood in the pericardium.

* * *

At the next meeting of the Chemical Society, on Thursday, May 3, papers will be read on "A New Oxide of Tellurium," "Tellurium Sulphoxide," and "A New Reaction of Tellurium Compounds," by Messrs. Edward Divers and M. Shimosé; "A Simple Modification of the Ordinary Method for Effecting the Combustion of Volatile Liquids by Glaser's Method with Open Tubes," by Mr. Watson Smith; and "On Acenapthene," by W. R. Hodgkinson, Ph.D.

* * *

The Annual General Meeting of the Chemists' Assistants' Association will be held on Wednesday evening, May 16th.

Transactions of the Pharmaceutical Society.

NORTH BRITISH BRANCH.

EVENING MEETING.

Wednesday, April 11, 1883.

(*Continued from page* 846.)

After the discussion on Mr. Maben's paper, the President called upon Mr. Patrick Geddes, F.R.S.E., Demonstrator of Botany, Edinburgh University, to deliver a lecture on the "History and Present State of the Cell Theory." In the course of the lecture the labours of Grew, Malpighi, Bichat, Brown, Schleiden, Schwann and recent investigators were reviewed. By means of a series of elaborate diagrams and other illustrations, the lecturer showed the identity of the animal and the vegetable cell, and gave an interesting account of recent investigations and theories. A *résumé* of the lecture will be given shortly.

Dr. Inglis Clark, in moving a vote of thanks to Mr. Geddes, said that everyone would be struck by the manner in which a very intricate subject had been made interesting. He had listened to the lecture with great pleasure, because it contained many points which were matters for reflection, and considering that a great deal of the subject matter was the result of research on the part of the lecturer, he was sure that the audience would join him in thanking Mr. Geddes for the manner in which he had brought the subject before them.

Mr. Stephenson seconded the motion, and Mr. Baildon, in supporting it, remarked that the lecture had been a very fascinating one. Beginners on the subject felt something very "dreech" about the bare details and long names, but when the beautiful history of the progress of discovery was told, the whole matter took shape and became thrilling with interest.

The motion was very heartily responded to by a large audience.

The President of the Branch then made the following remarks:—

"Gentlemen,—Our twenty-ninth session this evening comes to a close, and it may not be out of place to review it very briefly in its scientific, educational and trade aspects. At the first meeting on November 8 the business of the session was as usual commenced with a few opening remarks from the chair, after which a paper by Mr. D. B. Dott, F.R.S.E., on 'The Solubility of Morphia Salts,' was read. This included a valuable contribution to what is already known on the obscure subject of solubility generally, and particularly in reference to morphia salts. At our second meeting we had an interesting paper by Mr. Robert Aitken, on 'The Pharmacopœial Extracts of Aloes and their Preparation,' and also one giving details of a method for preparing syrup of phosphate of iron, by which the acidulous rather than the basilous radicle is precipitated; this was contributed by Mr. D. Gorrie. At our third meeting, Mr. Gilmour gave us an insight into the new edition of the United States Pharmacopœia, which raised an entertaining discussion, and Mr. Peter MacEwan read a note on 'Pungent Liniment of Iodine.' On the same evening, Mr. H. B. Baildon presented a fine bust of his father to the Society. This bust is a fitting memorial of one who was highly esteemed by those connected with this Branch, and who by the dignity of his personal and professional life did much for the elevation of pharmacy. The fourth meeting took place in February, when we had the pleasure of listening to a lecture by Dr. Matthew Hay, on 'The Methods for the Separation of Alkaloids.' This paper was principally devoted to the methods employed in original research, but independent of its purely scientific worth it contained much matter applicable to the everyday work of the pharmacist. At our fifth meeting, Mr. Maben showed a hot-air chamber which he has had in use in his own laboratory, and on the same evening Dr. Inglis Clark made a valuable communication on 'Acetic Ether;' the most valuable portion of this paper is that in which Dr. Clark proposes a modification of the process of purification, and which Professor Redwood regards as 'a great improvement on that described in the Pharmacopœia.' I need not remark on the papers which we have had the pleasure of listening to this evening. I have to congratulate the members of the Branch that so many of the papers have emanated from themselves, and I have to urge on those who are able to devote a little of their limited leisure in the course of the summer to the preparation of papers for our next session. Our special thanks are due to those members of professions allied to our own for the highly appropriate subjects on which they have lectured to us; and further, I am sure that you will all join with me in thanking all the gentlemen who have addressed us during the session." The President then referred to the "Pharmacy Acts Amendment Bill," and the educational requirements which would be entailed by it. In this respect he likened the Bill to the "Scottish Universities Bill," and remarked that Scotland at the present time is ripe for an advance in education. Having glanced at the commercial aspects of pharmacy at the present time, he concluded by thanking the members for the courtesy accorded to him in his discharge of the duties of the chair.

Mr. Stephenson proposed a vote of thanks to the President for his conduct in the chair, which was cordially responded to by the audience.

In the course of the evening it was intimated by the Secretary of the Branch that a paper by Mr. Hugh Macullum, Hong Kong, with specimens illustrative of an investigation in a case of malicious fish poisoning, had been forwarded but had not come to hand.

ANNUAL MEETING.

The Annual Meeting of the Branch was held in the Society's rooms, Edinburgh, on Tuesday, April 24, at 12 o'clock noon.

Mr. Alexander Napier, President of the Branch, took the chair, and called upon the Secretary to read the—

Annual Report.

The Council of the North British Branch of the Pharmaceutical Society again have the pleasure of submitting their Annual Report.

The operations of the Branch continue to be carried on with efficiency as hitherto.

The library and museum have been considerably augmented during the past year; several valuable donations have been made to the chemical portion, which has been greatly enriched thereby. Your Council would specially refer to a fine bust of the late Mr. H. C. Baildon, which has been presented by his son, Mr. H. B. Baildon, and which will prove a pleasing memorial of the valuable services which their late respected friend rendered to the cause of pharmacy, especially as represented by this Branch. The museum continues to be largely taken advantage of by students; the total number of visits during the past year being 1565, made up of 953 day visits and 612 evening visits. From the library, nearly three hundred volumes have been lent out, while a large number of volumes have been used for reference. These facts are a satisfactory indication that the educational facilities afforded by the Society are fully appreciated by our students.

In connection with the issue of special tickets for lectures in subjects allied to pharmacy, your Council are pleased to note the honourable positions taken by several students. This circumstance affords an opportunity of comparing pharmaceutical with other students attending these clases, and it shows that our students are not inferior to others.

There have been six evening meetings during the past year, the attendance being quite up to the average, and

on several occasions exceptionally good; but it is to be regretted that members generally do not avail themselves of the advantages which are presented by such meetings.

The papers read during the session have been of a highly interesting and instructive nature, and your Council desire to record their appreciation thereof and their indebtedness to those pharmacists who have made the communications. They also wish to express their warmest thanks to Dr. Matthew Hay and Mr. Patrick Geddes for the able and interesting lectures which they delivered under the auspices of the Council.

The Board of Examiners for Scotland have had four meetings for examination (in all on nine days) during the past year. Minor candidates have numbered 99, of whom 53 passed. These numbers show an increase of 26 candidates over the previous year, and failures to the extent of 46·5 per cent. For the Major examination there have been 9 candidates, of whom 4 passed, and 1 Modified candidate, who passed. Your Council have pleasure in noting a great improvement in Scottish Preliminary candidates since the last report: 204 candidates have presented themselves at the various centres in Scotland, and of these 118 have passed, showing 42 per cent. of failures as compared with 60 per cent. in the preceding year.

The most important event in the proceedings of the Society during the past year has been the adoption by the London Council of the suggestion of Mr. Schacht's Committee, that in future candidates for examination be required to produce evidence of having undergone a curriculum of education in botany, chemistry (both theoretical and practical), and materia medica, and that the examinations be divided into two parts, the first *written* and the second *oral*, with an interval of at least twelve months. Without entering into the debatable aspects of this measure your Council feel satisfied that its adoption, which it is proposed to effect in 1887, will greatly modify the distressing results of the examinations as they exist at present.

At the February meeting of the Council of the Society a draft Pharmacy Acts Amendment Bill was unanimously adopted. This Bill had been prepared on the suggestion of the Privy Council, chiefly with the view of placing some restriction on the sale of poisons under the guise of patent medicines, and of regulating the sale of poisonous articles, which there was a difficulty in embracing within the Poisons Schedule of the 1868 Act. Besides provision for these purposes the Bill contains various clauses for obviating difficulties and hardships which have been experienced in the operations of the last Act, and appears to have been drawn with great skill and with a practical adaptation to the purposes to be effected.

Your Council had a meeting to discuss the Bill and, although there were one or two dissentients, the great majority of members were in favour of supporting the London Council in promoting the measure almost in its entirety; and this resolution is simply an echo of an almost unanimous expression of opinion throughout the pharmaceutical body.

The Council have to record with feelings of regret—which they feel assured will be shared by all who knew him—the death of Mr. George Blanshard, for many years a member of this Council. Mr. Blanshard was a constant attendant at the meetings of this Branch, whether for business or scientific purposes, and his genial and gentlemanly bearing, as well as the zeal and diligence he always displayed in the interests of the Society, will cause his name to be long held in honour and esteem.

In laying on the table the result of the voting for the new Council, tabulated as formerly, your Council take the opportunity of referring to the alteration in the number of members, which was intimated in the nomination papers. This alteration was suggested by a committee appointed by the Council to inquire into the rules and precedents which have hitherto regulated the election and proceedings of the Council. The suggestion was adopted. The number, twenty-one, being believed to be that which would best ensure provincial representation, while the retirement of only two-thirds annually will provide for the continuous carrying on of the work.

Mr. Laird, in moving the adoption of the report, said that he was glad to know that the affairs of the Branch were in so satisfactory a condition. Much of this, he was sure, was due to the office-bearers, and he had pleasure in moving that the report be adopted.

Mr. Rait (Partick) seconded the motion, and it was unanimously adopted.

The President of the Branch then made some remarks regarding the work of the Branch, and a discussion thereon ensued, but no resolution was come to in the matter.

The Secretary to the Branch then submitted the results of the voting for the new Council as follows:—

Voting papers issued	247
Voting papers returned	134
Voting papers informal	4

Leaving 130 voting papers to be recorded.

These having been scrutinized it was found that the following gentlemen had a majority of votes, and were accordingly elected as the

Council for 1883–84.

Ainslie, William, 58, George Street, Edinburgh.
Baildon, H. Bellyse, 73, Princes Street, Edinburgh.
Borland, John, Kilmarnock.
Clark, William Inglis, 26, South Canongate, Edinburgh.
Frazer, Daniel, 131, Buchanan Street, Glasgow.
Gilmour, William, 11, Elm Row, Edinburgh.
Kermath, Wm. Ramsay, 18, Market Street, St. Andrews.
Kinninmont, Alexander, 69, South Portland Street, Glasgow.
Laird, George Hardie, 40, Queensferry Street, Edinburgh.
Mackay, George Duncan, Canning Street, Edinburgh.
Mackenzie, James, 45, Forrest Road, Edinburgh.
MacRitchie, David, 30, High Street, Inverness.
Napier, Alexander, 69, South Clerk Street, Edinburgh.
Nesbit, John, 162, High Street, Portobello.
Pinkerton, William, 17, Greenside Place, Edinburgh.
Stephenson, John B., 48, Frederick Street, Edinburgh.
Storie, Robert, 94, High Street, Dalkeith.
Storrar, David, 228, High Street, Kirkcaldy.
Strachan, Alexander, 148, Richmond Street, Aberdeen.
Watt, James (Senior), Haddington.
Young, James R., 17, North Bridge, Edinburgh.

Mr. Gilmour, in proposing a vote of thanks to Mr. Napier, said that as a President of the Branch that gentleman had been anxious to conduct his duties faithfully, and in doing so had been quite alive to the interests of the Branch and the Society. He very heartily proposed the thanks of the meeting for his conduct in the chair at that time and during the year he had held office.

Mr. Young seconded the motion, remarking that Mr. Napier had been assiduous in his attention to the duties of his office, and had shown great ability in conducting the affairs.

Mr. Napier returned thanks, and moved a similar vote to Mr. Nesbit, Vice-President, which was cordially agreed to.

Mr. Watt (Haddington) then moved a vote of thanks to the Honorary Treasurer (Mr. Stephenson). In doing so he said that a remarkable amount of enthusiasm had been thrown into any work which Mr. Stephenson had undertaken. This, coupled with his knowledge of affairs, had tended greatly to carry on the work which had fallen to the share of the late Mr. Mackay.

Mr. Mackenzie seconded and Mr. Nesbit supported the motion.

Mr. Stephenson having replied, the meeting adjourned.

The new Council met after the Annual Meeting for the election of office-bearers for the ensuing year, with the following result:—

President of the Branch, Mr. John Nesbit; Vice-President, Mr. H. Bellyse Baildon; Auditors, Messrs. Mackenzie and Young.

EXAMINATIONS IN EDINBURGH.

April 18, 19 *and* 20, 1883.

Present on each day—Messrs. Ainslie, Baildon, Clark, Gibson, Gilmour, Kinninmont, Nesbit and Stephenson.

Professor Maclagan was also present, on behalf of the Privy Council.

MAJOR EXAMINATION.

18*th.*—*Four* candidates were examined. *Three* failed. The undermentioned passed, and was declared qualified to be registered as a Pharmaceutical Chemist:—

Holmes, James Henry.....Kendal.

MINOR EXAMINATION.

18*th.*—*Ten* candidates were examined. *Seven* failed. The undermentioned *three* passed, and were declared qualified to be registered as Chemists and Druggists:—

Anderson, George Watson .....Forres.
Barlow, George Robert .....Congleton.
Campion, Martin Hand .....Louth.

19*th.*—*Twelve* candidates were examined. *Five* failed. The undermentioned *seven* passed, and were declared qualified to be registered as Chemists and Druggists:—

Cooper, Albert .....Huntingdon.
Donald, Andrew .....Perth.
Douglas, William .....Woodside.
Dunbar, George ....Dumfries.
Duncan, Adam ... .Edinburgh.
Edwards, Rees William .....Brecon.
Hendry, Robert Love .....Edinburgh.

20*th.*—*Twelve* candidates were examined. *Eight* failed. The undermentioned *four* passed, and were declared qualified to be registered as Chemists and Druggists:—

Scott, Charles .....Fraserburgh.
Simpson, Charles .....Aberdeen.
Slater, James Morrieson .....Loftus in Cleveland.
Thresh, Arthur..... .....Buxton.

PRELIMINARY EXAMINATION.

At a meeting of the Board of Examiners for England and Wales, held on Wednesday, April 25, 1883, the report of the College of Preceptors on the examination held on April 3rd was received.

Three hundred and sixty-six candidates had presented themselves for examination, of whom *one hundred and ninety-five* had failed. The following *one hundred and seventy-one* passed, and the Registrar was authorized to place their names upon the Register of Apprentices or Students:—

Adamson, John Robert .....Bishop Auckland.
Affleck, John.....Fort William.
Affleck Theodore Sykes .....Swindon.
Aitken, Thomas ....Kilmarnock.
Alexander, William Maxwell...Dundee.
Allanson, James .....Wishaw.
Allez, Peter Arnold .....Guernsey.
Anderson, George H. .....Edinburgh.
Andrews, Edward Arther .....London.
Angel, Alfred ....Guernsey.
Arnold, John Julius.....Brighton.
Aslin, William .....Sunderland.
Aspland, Wm. Harold G. .....Newark.
Bagshaw, George William .....Kenilworth.
Baker, William James.....Bradford.
Bard, Cecil Harry .....Exeter.
Barker, Joseph .....Doncaster.
Bates, John .....Bicester.
Beynon Benjamin .....Swansea.
Botterill, Frederick William ...Otley.
Bradbury, Charles.....New Fletton.
Brassington, Herbert William...Rugeley.
Breese, Charles..... .....London.
Brent, Arthur Redding .....Ashford.
Briggs, Thomas..... ...Halifax.
Broadley, John Wilfred .....Louth.
Bromwich, Thomas .....Dudley.
Bunting, Edmund Robert .....Hoylake.
Butterworth, Frederick .....Rochdale.
Carter, Thomas.....Hereford.
Chaplin, Albert Edward ..... Taunton.
Church, Edward Harry .....Cambridge.
Clark, Alexander John .....Grantown-on-Spey.
Cole, Harold .....Congleton.
Colenutt, Frederick Moreton ...Shanklin.
Cook, Thomas Marsden .....Hindley.
Cooper, Edwin .....Lincoln.
Cripps, George Thornton.....Devizes.
Cussons, John William .....Ossett.
Davies, Charles Gardiner .....London.
Davies, James Lloyd .....Talgarreg.
Davis, George David .....Malvern Link.
Davis, William Orton .....Malvern Link.
Dawson, William Thorndick ...Norwich.
Dickie, Thomas.....Glasgow.
Dixon, Richard.....Newport, I. W.
Downing, Samuel.....Braintree.
Drayton, Ernest .....Tunbridge Wells.
Drysdale, Robert .....Dalmeny.
Edmondston, Francis E. .....Edinburgh.
Evans, Alexander Rae.....Ely.
Evans, Dewi Louis .....St. Clears.
Evans, John ..... Neyland.
Feather, Arad .....Pontefract.
Field, Reeve Holyoake .....Birmingham.
Fitton, Robert .....Huddersfield.
Fisher, George William .....Holt.
Fletcher, Richard Bewley .....Sunderland.
Flint, Charles .....Stratford-on-Avon.
Flynn, William.....Lockerbie.
Forrester, William .....Lochee.
Fowler, Harry .....Shrewsbury.
Fraser, Robert .....Macduff.
Galt, Thomas James .....Thornley.
Gardner, John .....Bolton le Sands.
Gass, George Muncaster .....Whitehaven.
Gee, Ernest .....Bath.
Golland, James Henry .....Sheffield.
Goodman, Frederick William...Newport Pagnell.
Grammer, Frank .....Newark.
Green, Walter .....Hendon.
Green, William Henry .....Gargrave.
Greenhill, James Donaldson ...Glasgow.
Grimes, Henry .....Chesterfield.
Harrison, William Arthur .....Louth.
Hayton, Thomas R.....Plymouth.
Herington, Horace Edward ...Leighton Buzzard.
Hobson, Edmund.....Cheadle.
Hollely, Thomas Lowe .....Ollerton.
Hopley, David .....Goole.
Hughes, Philip Henry Alban...Liverpool.
Jackson, Thomas .....Altrincham.
Jones, John .....Rhyl.
Joy, Thomas George ....Cardiff.
Keddell, Charles Frederick .. Epsom.
Keene, Bernard .....London.
Kingston, George Thomas .....Bath.
Kirk, James .....Edinburgh.
Lee, George .....Barnstaple.
Letheren, Samuel Kemp.....London.
Lock, James .....Edinburgh.
Lockyer, Cuthbert Hy. Jones...Bruton.
Loeffler, George Berthold .....London.
Long, Frederick C. .....Norwich.
Lonnon, Walter .....Sheerness.

Macaulay, Donald .....Inverness.
McGregor, James .....Aberdeen.
Macintosh, P. F. .....Dunfermline.
Mackridge, William.....Barnsley.
Makepeace, Alfred Joseph .....Nuneaton.
Martin, Stanley .....Derby.
Masterman, Francis John .....Driffield.
Matheson, Joseph Milne.....Andover.
Mennie, Robert.....Aberdeen.
Menzies, James Acworth .....Inverkeithing.
Miles, William Henry.....Portishead.
Millard, Edgar James.....Derby.
Millard, Percy .....London.
Mitchell, Walter Stuart .....Gloucester.
Moffat, John Archibald .....Whitehaven.
Mollard, James Kingston .....Penzance.
Morris, William John .....Pontypridd.
Mousley, William Joyce .....Redditch.
Munro, James Innes .....Perth.
Murdoch, Henry William .....Macduff.
Murray, Allan Grierson .....Annan.
Muskett, Frederic James .....Newport Pagnell.
Newton, Arthur .....Northwich.
Nicholson, Gilbert .....Tunbridge Wells.
Ogdon, William .....Derby.
Pate, Charles .....Lincoln.
Paternoster, George Sidney ...Cirencester.
Peach, Charles William .....London.
Pegg, Joseph Edmund Jones ...Birmingham.
Phillips, Henry Allan .....Tavistock.
Pilkington, George Ratcliffe ...Haslingden.
Plevin, John .....Birkenhead.
Pottage, Frank Ernest .....Edinburgh.
Price, Joseph .....Wrexham.
Robertson, Robert .....Leith.
Robinson, Richard Hardy .....Wainfleet.
Roe, Edwin John .....Nottingham.
Rowlands, William Handcock...Cardigan.
Ryall, Frederick John.....Devonport.
Sanderson, John William .....Leeds.
Sewell, William John .....Barton-on-Humber.
Shand, Alexander.....Dunfermline.
Skinner, Donald McDougall ...Oban.
Slinn, Frederick Harry .....Rhyl.
Standing, William .....Darwen.
Staniland, Edwin Marshall.....Tadcaster.
Stark, George Miller .....Gatehouse.
Stephen, David J.....Kilmarnock.
Stewart, Robert McAll .....Penryn.
Stirling, David Alexander .....Dunoon.
Stone, Leopold Hawkin .....Holsworthy.
Thomas, David.....Brynaman.
Thomas, Isaac Jenkin.....Aberavon.
Thomson, John.....Dalbeattie.
Thomson, Marshall .....Banchory Ternan.
Thorne, Henry Courtenay .....Taunton.
Thorpe, Arthur Winton .....Northampton.
Thursfield, Bevington .....Kettering.
Tilsley, James Henry .....Berriew.
Timmis, John .....Silverdale.
Turnbull, Henry John.....Darlington.
Turner, George Reuben .....Peterborough.
Vassalli, Bartholomew Joseph ..Leeds.
Wadsley, William.....Wisbeach.
Waitt, Walter .....Cheltenham.
Wall, Henry Watson .....Coleshill.
Walters, James Lewis.....Burry Port.
Watkins, William H. .....Pontypridd.
Weekes, Ambrose.....Rochester.
White, Thomas Henry.....Whitby.
Wilkinson, Sidney .....Birkenhead.
Wilkinson, William .....Bradford.
Williams, Arthur John Berry...Wolverhampton.
Willington, Joseph Arthur.....Sheffield.
Wilson, John Codner .....London.
Wood, Albert Edward.....Highbridge.

The following is a list of the centres at which the examination was held, showing the number of candidates at each centre and the result:—

	Candidates.				Candidates.		
	Examined.	Passed.	Failed.		Examined.	Passed.	Failed.
Aberdeen	8	5	3	Lancaster	9	1	8
Birmingham	18	10	8	Leeds	20	10	10
Brighton	5	2	3	Lincoln	9	7	2
Bristol	11	6	5	Liverpool	18	6	12
Cambridge	5	1	4	London	49	19	30
Canterbury	2	1	1	Manchester	22	8	14
Cardiff	7	5	2	Newcastle-on-T.	6	3	3
Carlisle	8	2	6	Northampton	7	4	3
Carmarthen	10	5	5	Norwich	9	3	6
Carnarvon	6	2	4	Nottingham	8	4	4
Cheltenham	6	4	2	Oxford	1	1	0
Darlington	5	3	2	Peterborough	3	3	0
Dundee	4	3	1	Sheffield	10	5	5
Edinburgh	28	13	15	Shrewsbury	6	3	3
Exeter	12	8	4	Southampton	5	2	3
Glasgow	17	9	8	Truro	4	2	2
Guernsey	3	2	1	Worcester	7	3	4
Hull	9	3	6	York	7	2	5
Inverness	2	1	1				

The questions set for examination were as follows: —

Time allowed: Three Hours for the three subjects.

I. LATIN.

1. Translate into English:—

(i.) Ipse de quarta vigilia eodem itinere *quo* hostes ierant ad eos contendit, equitatumque omnem ante se mittit. (ii.) *Diutius* quum sustinere nostrorum impetus non *possent*, alteri se ut coeperant in montem receperunt, alteri ad impedimenta et carros suos se contulerunt. (iii.) *Id* ea maxime ratione fecit, quod noluit eum *locum* unde Helvetii *discesserant* vacare, ne propter bonitatem agrorum Germani e suis finibus in Helvetiorum fines *transirent* et finitimi Galliæ provinciæ Allobrogibusque essent. (iv.) His *rebus cognitis* Cæsar Gallorum animos *verbis* confirmavit, pollicitusque est sibi eam rem curæ futuram; magnam se habere spem et beneficio suo et auctoritate adductum Ariovistum finem injuriis facturum.

2. Parse the words in italics in the above extracts.

3. Decline together *hoc verbum* and *ea res*; and give the principal parts of the verbs *mitto*, *facio*, *duco* and *venio*.

4. Translate into Latin:—

(i.) All the cavalry will be sent by the same route. (ii.) We will betake ourselves to the mountains. (iii.) The general sees that the soldiers cannot sustain the attacks of the enemy. (iv.) The horsemen having been sent accross the river, the Gauls suddenly attack the camp.

II. ARITHMETIC.

[The working of these examples, as well as the answers, must be written out in full.]

1. How many yards of carpet, $\frac{3}{4}$ of a yard wide, will cover a room 16 feet wide and $27\frac{1}{2}$ feet long?

2. If 20 men can reap a field of 105 acres in 6 days of 12 hours each, how long will it take 16 men to reap 126 acres, working 16 hours a day?

3. Multiply the sum of $2\frac{1}{3}$ and $3\frac{1}{4}$ by the difference between $4\frac{3}{7}$ and $2\frac{1}{5}$.

4. Reduce $\frac{47}{82}$ and $\frac{7}{1280}$ to decimals; and reduce $\cdot\dot{5}\dot{7}\dot{3}$ to a vulgar fraction.

Multiply 1·525 by 80·08, and divide 31·5 by 126.

5. Give the ratio of a yard to a metre, and of a pint to a litre. Express 7 miles 7 furlongs in metres to four places of decimals.

III. ENGLISH.

1. Define *transitive verbs* and *intransitive verbs*, illustrating your definitions by examples. What difference is indicated by the terms *strong verbs* and *weak verbs*? Give the present tense of the verbs of which *sped, lit, cloven, shorn, gotten, flown* are respectively the past participles.

2. Show, by example, that *after, before,* and *since* may ae used—(i.) as adverbs, (ii.) as prepositions, (iii.) as conjunctions.

3. Parse each word in the following sentence:—"How wretched is that poor man that hangs on princes' favours!"

4. Correct the following sentences, giving your reason in each case:—(i.) Haste as well as waste are to be avoided. (ii.) Anybody may have this, I care not whom. (iii.) Paley's 'Evidences' are a well known book. (iv.) In memory of John Smith, born March 1, 1854, died July 2, 1876.

5. Write a short composition on one of the following subjects:—(i.) The Suez Canal; (ii.) Examinations; (iii.) Ventilation; or (iv.) give an account of some distinguished writer.

BOTANICAL PRIZE FOR 1884.

A Silver Council Medal is offered for the best Herbarium, collected in any part of the United Kingdom, between the first day of May, 1883, and the first day of June, 1884; and should there be more than one collection possessing such an amount of merit as to entitle the cellector to reward, a second prize, consisting of a Bronze Medal, and also Certificates of Merit, will be given at the discretion of the Council. In the event of none of the collections possessing sufficient merit to justify the Council in awarding medals or certificates, none will be given.

Competitors must be Associates or Apprentices or Students of the Society, and under twenty-one years of age.

The collection must consist of phanerogamous plants and ferns, arranged according to the natural system of De Candolle, or any other natural method in common use, and be accompanied by lists, arranged according to the same method, with the species numbered.

The collector must follow some work on British botany (such as that of Babington or Hooker), and state the work he adopts. The name of each plant, its habitat, and the date of collection must be stated on the paper on which it is preserved.

Each collection must be accompanied by a note, containing a declaration signed by the collector, and certified by his employer, or a pharmaceutical chemist to whom the collector is known, to the following effect:—The plants which accompany this note were collected by myself, between the first day of May, 1883, and the first day of June, 1884, and were named and arranged without any other assistance than that derived from books.

In estimating the merits of the collections, not only will the number of specimens be taken into account, but also their rarity or otherwise, and the manner in which they are preserved, and should a specimen be wrongly named, this will be erased from the list.

The collection must be forwarded to the Secretary of the Society, 17, Bloomsbury Square, on or before the first day of July, 1884, indorsed "Herbarium for Competition for the Botanical Prize." After the Prize Distribution in October, collections will be retained one month, under the care of the Curator of the Museum, for the inspection of persons connected with the Society, and then returned to the collector, if required.

Pharmaceutical Society of Ireland.

MEETING OF THE COUNCIL.

A special meeting of the Council was held at the College of Physicians, Kildare Street, Dublin, on Monday, April 16, at three o'clock, p.m.

Present—Professor Tichborne, President; Dr. Collins, Messrs. Allen, Bennett, Brunker, Draper, Hayes, Simpson and Wells.

The meeting had been called with a view to consider the subject of the compilation of the Pharmacopœia and the advisability of attempting to secure the introduction into the new Medical Acts Amendment Bill (House of Lords) of a clause to provide for the formation of a standing committee of medical men and pharmacists for the purpose of compiling the Pharmacopœia.

After the subject had been discussed at some length with reference to what course should be adopted by the Council in the matter, it was proposed by Mr. Brunker, seconded by Mr. Draper, and resolved—

"That a memorial be drawn up and forwarded to Lord Carlingford, the member of the Government in charge of the Medical Bill in the House of Lords, praying that the pharmaceutical bodies in these Kingdoms shall be represented on the body to whom shall be committed the revision of the British Pharmacopœia."

Proposed by Mr. Brunker, seconded by Mr. Allen, and resolved—

"That a petition be drawn up to the House of Lords, conveying the same prayer, and that it be sent to the President of the Pharmaceutical Society of Great Britain, to be entrusted by him for presentation to such member of the House as he may think best."

The following memorial was then drawn up and agreed to:—

"To the Right Honourable Lord Carlingford,

"Lord President of the Council.

"The Memorial of the President and Council of the Pharmaceutical Society of Ireland—

"Humbly showeth, that this Council has had its attention called to the Medical Bill now before the House of Lords, and the clauses of same refering to the periodic revision of the British Pharmacopœia, and the absence of any provision by which the pharmaceutical bodies of these Kingdoms shall have a voice in such revision.

"They therefore pray that in any body appointed for this purpose due representation shall be accorded to pharmacists, as having special qualifications for aiding in an undertaking of such importance to the country.

"And your memorialists will ever pray.

"Signed on behalf of the Pharmaceutical Society of Ireland,

"Charles R. Tichborne, LL.D., Ph.D., *President.*

"Hugh James Fennell, *Registrar.*"

The Registrar was instructed to forward the memorial to Lord Carlingford, and to have the petition to the House of Lords engrossed on parchment, and forwarded as directed by the above resolution.

The Council then rose.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

A meeting of this Society was held on Thursday, April 19, Dr. W. H. Perkin, F.R.S., President, in the chair.

The following certificates were read for the first time:—

C. Beringer, H. E. Harrison, C. Hulke, E. H. B. Stephenson, A. Smith.

During the evening a ballot was held and the following gentlemen were declared by the scrutators, Messrs.

Spiller and Groves, to be duly elected Fellows:—T. L. Briggs, J. A. Basker, J. B. Coleman, W. H. Cannon, E. C. Conrad, C. Gillett, E. C. Hemming, N. K. Humphreys, L. Levy, A. Ness, V. J. Schopoff, A. E. Wilson.

The President called on Dr. Percy Frankland to read a paper on—

The Gases Evolved during the Conversion of Grass into Hay. By P. F. Frankland and F. Jordan.—About 5 grams of finely cut grass were imprisoned in a small retort adapter, which was then filled with mercury, the small end of the adapter corked up, the cork protected by a mercury cup, and the whole allowed to remain over mercury during the observation. In atmospheric air at 15° C. 3 c.c. of gas were evolved in three days and 4 c.c. more in thirty days. The gas in the first case was composed of CO_2, 46·35 per cent., O, ·07 per cent., N, 53·58 per cent.; in the second case CO_2, 85·33, O, 0·00 per cent., N, 14·67 per cent. Other experiments were made in which the grass was surrounded by atmospheres of carbonic anhydride, of hydrogen and of oxygen, with almost similar results; the authors conclude that the atmosphere with which the grass is surrounded has but little influence either upon the volume or the composition of the gas evolved; the grass in every case undergoes a rapid process of oxidation in which it speedily removes all the oxygen from the atmosphere with which it is surrounded, and in the absence of any oxygen in the free state, with which to combine, much carbonic acid is produced at the expense of the combined oxygen present in the grass. When, however, free oxygen is present in the atmosphere surrounding the grass, the gas evolved contains a considerable proportion of nitrogen. At a temperature of 36° C. more gas is evolved than at 15°. In all cases, carbonic anhydride is the chief product of decomposition, whilst hydrogen and hydrocarbons appear in only very small quantities. The authors have made similar experiments as to the gases evolved by grass when kept under water. Large volumes of gas are evolved (about five times as much as in the previous experiments), which are characterized by the presence of a notable proportion of hydrogen, which is doubtless due to the lactic fermentation induced by bacteria; acetic, lactic and probably propionic acids with bacteria being found in the water. If the water contain phenol or mercuric chloride or if the grass be steamed, no gas is evolved.

Dr. Voelcker said the paper was peculiarly interesting, not only from a scientific point of view, but from its direct bearing on the making of hay in wet weather and on the preservation of grass as "ensilage." The changes observed when the grass was immersed in water were those which take place in the "silo." He had examined some "ensilage" from Boston and had found considerable quantities of propionic and acetic acids. These acids are the best preservers of green food; the grass is in fact pickled. Well-made ensilage can be exposed without becoming mouldy; it contains no sugar. It would be interesting to know to what extent, as indicated by loss of weight, the changes observed by the authors had taken place. He had made some observations at Rothamsted, on a stack of hay made in dry weather under the most favourable conditions, and the loss was only 5 per cent.; on the other hand a stack made in wet weather at Cirencester had become so hot that it had to be taken down, and the quantities of carbonic anhydride, aldehyd and acetic acid completely overpowered the men employed. In the lower part of this stack the grass was completely calcined and 5 or 6 pounds of ash were collected. Now it would be extremely interesting to determine quantitatively the loss which grass undergoes when improperly stacked and to study the effect of temperature on these changes.

The President asked if any experiments had been made as to the composition of the combustible gases evolved, whether any marsh gas was present.

Dr. Percy Frankland said he had not been able to weigh the grass after the experiments; and that most of the combustible gas was absorbed by strong sulphuric acid.

Dr. L. T. Thorne then read a—

Note on an Apparatus for Fractional Distillation under Reduced Pressure.—By means of this apparatus, which was exhibited by the author, the various fractions can be removed from time to time without impairing the vacuum and the distillation can therefore be continued from beginning to end without interruption. If the substance under distillation is affected by exposure to the air any inert gas can be introduced instead of air without disturbing the apparatus.

The President said that the apparatus had been in use in his laboratory for some time, it seemed to be very convenient and answered extremely well.

Mr. W. H. Deering then read a paper entitled—

Notes on the Condition in which Carbon exists in Steel. By Sir F. A. Abel, C.B., and W. H. Deering.—Two series of experiments were made; in the first series discs of steel 2·5 in. in diameter and 0·01 in. thick were employed; they were all cut from the same strip of metal, but some were "cold-rolled," some "annealed" and some "hardened." The total carbon was found to be —"cold-rolled," 1·108 per cent., hardened, 1·128 per cent., and annealed, 0·924 per cent. and 0·860 per cent. Some of the discs were submitted to the action of an oxidizing solution consisting of a cold saturated solution of potassium bichromate with 5 per cent. by volume of pure concentrated sulphuric acid. In all cases a blackish magnetic residue was left undissolved. These residues, calculated upon 100 parts of the discs employed had the following compositions:—"cold-rolled" carbon, 1·039 per cent., iron, 5·87 per cent., annealed, C, 0·83 per cent., Fe, 4·74 per cent., hardened, C, 0·178 per cent., F, 0·70 per cent.; so that by treatment with chromic acid in the cold, nearly the whole of the carbon remains undissolved with the cold-rolled and annealed discs, but only about one-sixth of the total carbon is left undissolved in the case of the hardened disc. The authors then give a *résumé* of previous work on the subject. In the second part they have investigated the action of bichromate solutions of various strengths on thin sheet steel about 0·008 in. thick, which was cold-rolled, and contained carbon, 1·144 per cent.; silica, 0·166 per cent.; manganese, 0·104 per cent. Four solutions were used; the first contained about 10 per cent. of bichromate and 9 per cent. of H_2SO_4 by weight, the second was eight-tenths as strong, the third about half as strong, the fourth about one and a half times as strong. In all cases the amount of solution employed was considerably in excess of the amount required to dissolve the steel used. A residue was obtained as before. With solution 1 the residue contained C, 1·021; solution 2, C, 0·969; solution 3, C, 1·049 (the atomic ratio of iron to carbon was $Fe_{2\cdot694}C_1$, $Fe_{2\cdot65}C_1$, $Fe_{2\cdot867}C_1$); solution 4, C, 0·266 per 100 of steel. The authors conclude that the carbon in cold-rolled steel exists, not simply diffused mechanically through the mass of steel, but in the form of an iron carbide, Fe_3C, a definite product capable of resisting the action of an oxidizing solution (if the latter is not too strong), which exerts a rapid solvent action upon the iron through which the carbide is distributed.

Mr. Spiller said that there was, perhaps, a possibility of decomposing the carbide of iron, if all the iron present were deposited, and suggested that it would be preferable to leave a little iron undissolved to prevent this risk.

Mr. Deering said that it seemed to him the only natural stopping point was to dissolve as much as possible with a given solution and examine the residue.

On the Spectrum of Beryllium, with Observations relative to the Position of that Metal among the Elements. By W. N. Hartley.—Owing principally to the difficulty of

obtaining beryllium pure, it is still questionable whether beryllium is a triad with atomic weight 13·8 and oxide Be_2O_3, or a dyad with atomic weight 9·2 and oxide BeO. The author has photographed the spark spectrum from a saturated solution of the chloride, prepared from pure oxide presented to him by Dr. Emerson Reynolds, and concludes that beryllium is the first member of a dyad series of elements of which, in all probability, calcium, strontium and barium are homologues.

The Society then adjourned to May 3.

CHEMISTS' ASSISTANTS' ASSOCIATION.

At a meeting of this Association held on Wednesday, April 11, a paper was read by W. Ralph Dodd, entitled "A Few Hints on Germs in Disease." He stated if there was one subject more than another about which there was so many conflicting opinions, it was the question of germs. He pointed out that bacteria were known as early as 1675, but were looked upon as mere microscopic and scientific curiosities, and that it is only of recent date that their life history has been made out, and they have been relegated to their proper position in the organic world. He stated that they belonged to the order Schizomycetes, the simplest organism of the vegetable world, thriving best in liquids that contain decomposing or decomposable organic matter. They were all semi-cellular and as yet are seen only to reproduce themselves by cell division. Diagrams were shown illustrating the various species of the order: *Bacterium Termo*, associated with ordinary putrefactive change, *B. Limola*, the germ which produces the lactic fermentation of milk, and also other species, with their functions, were described. The incredulity that existed with reference to spontaneous germination was alluded to, and it was mentioned that at one time creatures as high up in the scale as frogs were supposed to be without parental origin, and that caterpillars were thought to be evolved from the leaves upon which they fed. The important part which these organisms play in putrefaction was pointed out, and that in their absence the process was a very slow one indeed. Some experiments of Pasteur, Koch and others on sheep, cattle, silkworms, etc., were cited as showing what relation these organisms bear to the various diseases in the human species, and it was pointed out that no less than thirty zymotic diseases were attributed to the so-called germs. On the other hand some were of opinion that they are not the actual cause of the disease, but rather that they are associated with it, since they do undoubtedly coexist with the disease. Various processes of staining were detailed for the detection of these germs in the tissues of the body for their isolation and cultivation outside of the animal body.

Some interesting microscopic specimens were shown of *Bacillus tuberculosis*, *B. Anthrax*, in lung and liver, from cases of splenic fever, and others, putrefactive bacteria, woolsorter's diseases, etc., etc.

Parliamentary and Law Proceedings.

Poisoning by a Narcotic.

An inquest was held by the Birmingham Borough Coroner (Mr. H. Hawkes), on Saturday, April 21, on the body of Edward Kiernan, 22, manufacturer's clerk, who had been found lying in bed dead. There was a small medicine bottle on the side table empty, and under a book on the table was found a letter addressed to the coroner, in which deceased expressed his intention to commit suicide.

Joseph Lucas, chemist, Colmore Row, stated that on Monday evening deceased called on him, and asked for a mixture of chloral so that he might get some sleep. Witness strongly advised deceased to try and do without narcotics, but deceased said if he did not get something to make him sleep he should have to take a dose of another kind. Finding deceased was determined to have sleeping draughts, witness let him have the bottle produced containing 2 drachms of chloral and 2 drachms of bromide of potassium, 2 drachms of spirit chloroform, and 2 drachms of syrup. This was made up to an ounce and a half, and the direction was that a twelfth of the whole was a dose. If deceased had taken the whole at once it was sufficient to poison him.

A verdict of "Suicide whilst in a state of temporary insanity" was returned.

Obituary.

CHARLES HERBERT HUTCHINSON.

The death is announced, at the early age of 24, of Mr. Charles Herbert Hutchinson. Mr. Hutchinson was a student from 1874 to 1877 in the laboratories of the Pharmaceutical Society, and afterwards studied at Wiesbaden with Professor Fresenius. Upon his return to England he occupied the position of Assistant-Curator of the Pharmaceutical Society's Museum, and then became Assistant to Professor Armstrong, at the London Institution and at the City and Guilds of London Institute in Cowper Street. In 1879 he was elected a Fellow of the Chemical Society, and in the year following began to interest himself in brewing. With this object he studied at Burton-on-Trent, and also at Strassburg, finally becoming proprietor of a brewery in Essex. Mr. Hutchinson was a prominent member of the School of Pharmacy Students' Association. In 1877 and again in 1878 he was elected Vice-President, and for four years fulfilled the duties of Reporter upon Inorganic Chemistry. Many of his Reports have been published in this Journal, and are noteworthy for the concise way in which papers containing the details of scientific work have been brought together and condensed so as to form summaries containing the essential points of long and intricate yet interesting and important researches. The following are the most important of Mr. Hutchinson's contributions:—"The Chemical Constituents of Ivy Berries" (with Mr. R. H. Davies), *Pharm. Journ.*, [3], vii., 275; "Myrtus Chekan," *Pharm. Journ.*, [3], ix., 653; "The Formulæ of some Inorganic Substances," [3], x., 841, and xi., 141; "Berthelot and Ditte's Researches upon the Hydrochlorides of the Metallic Chlorides," [3], xi., 1053; "Soxhlet's Researches upon the Quantitative Estimation of the Sugars," [3], xi., 720, 757; "Quantitative Electrolytic Analysis," [3], xii., 715.

Those who knew Mr. Hutchinson, and there are not a few in pharmacy, will regret the loss of one who stood high in the estimation of all as an able and conscientious worker of great promise, while his familiar friends will sadly miss the exhilarating effect of his amiable fellowship.

Notice has also been received of the death of the following:—

On the 21st of March, Mr. John Watkins, Chemist and Druggist, High Street, Abergavenny. Aged 53 years.

On the 24th of March, Mr. John Anderton, Chemist and Druggist, Northgate, Halifax. Aged 60 years.

On the 2nd of April, Mr. John Reay, Chemist and Druggist, St. Bees, Cumberland. Aged 54 years.

On the 6th of April, Mr. John Allan Paige, Chemist and Druggist, South Street, South Molton. Aged 79 years.

On the 7th of April, Mr. George Walter Brock, Chemist and Druggist, Chelmondiston, Suffolk. Aged 43 years.

On the 7th of April, Mr.

and Druggist, Charles Street, St. John's Wood, London. Aged 55 years.

On the 8th of April, Mr. George Wilson, Chemist and Druggist, Cathcart Street, Greenock. Aged 53 years.

On the 8th of April, Mr. William Howell, Chemist and Druggist, King's Lynn. Aged 29 years.

On the 10th of April, Mr. Frederick Robertson Martin, Pharmaceutical Chemist, Clevedon. Aged 40 years.

On the 12th of April, Mr. George Samuel Drury, Chemist and Druggist, Parrock Street, Milton. Aged 50 years. Mr. Drury had been a Member of the Pharmaceutical Society since 1875.

On the 13th of April, Mr. John Becket Hurst, Pharmaceutical Chemist, Market Place, Louth. Aged 36 years. Mr. Hurst had been a Member of the Pharmaceutical Society since 1870.

On the 21st of April, Mr. Thomas Baker, Chemist and Druggist, Islip Street, Kentish Town, London. Aged 41 years.

Notes and Queries.

[746]. Horse Hair.—Can any of the readers of the *Pharmaceutical Journal* inform me of a process for destroying the yellow pigment in horse hair? That at the root is quite white, becoming yellow or auburn towards the tip. Under 50 diameters the pigment appears crystalline. Of course this must be got rid of without destroying the hair. "Norsk."

Correspondence.

**** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Pharmacy Acts Amendment Bill.

Sir,—The expression of opinion respecting clause 2, which was appended to the resolution carried at the recent meeting in Manchester, might, with advantage, have been more clearly worded, but it was not based upon any misconception or erroneous assumption, as conjectured by you in your leader of last week.

The feeling of the meeting was one of regret that the Council had relinquished the claim, so recently made by them, to include, in the interests of the public, these same "poisonous" articles in the list of scheduled "poisons." In other words, that it had been thought necessary to admit the principle of allowing unregistered persons to sell poisonous articles, *i.e.*, poisons, when the main object of the poison clauses of the Pharmacy Act of 1868 was to limit, as well as regulate, the sale of them. We can hardly be blamed for supporting a view so clearly expressed in the earlier clauses of that Act, and so often and so ably enlarged upon by you on former occasions.

If Parliament will not accept the suggestion that these be added to the list of scheduled poisons, is it necessary to make such a compromising proposition as the one objected to by us?

If it be desirable in the interests of the public to limit, as well as regulate, the sale of poisons, surely it is inconsistent to approve the unrestricted sale of these so-called "poisonous" articles, no whit less deadly than those included in the Poisons Schedule of the 1868 Act. The fact that they have not yet been included is no argument that they ought not to be; the former action of the Council points, indeed, in quite the opposite direction. It was both logical and consistent for us, therefore, to object to the introduction of a clause approving of the sale of these articles by unregistered persons.

I fail to see that there is anything erroneous in our assumption that the particular articles referred to are not less a "part of the materia medica which appertain exclusively to the practice of the arts of pharmacy and medicine," than oxalic acid, corrosive sublimate, cyanide of potassium, vermin killers, etc., which were, with one accord, included in the poisons schedule.

F. Baden Benger,
Hon. Sec. Manchester Chemists and Druggists' Association

Sir,—As you have devoted two columns to our meeting at Manchester, I may venture to ask room for an explanation of the paragraph in the resolution which relates to clause 2. It is perhaps rather unfortunately worded and does not exactly express what was intended by the meeting, but not expecting a whole page of criticism and half a column of editorial lecturing we did not choose our words so carefully as we otherwise might have done. The real intention of the resolution was to express regret that "a legal sanction for the sale of poisonous articles by unregistered persons had been proposed for the first time in a Bill promoted by the Pharmaceutical Society," not that they were to be allowed to sell them. We are not quite so ignorant as not to know that unregistered persons are, and always have been, entitled to sell the articles in question, and, therefore, need no permission for continuing to do so, nor did we wish to interfere with established usage in that respect; but the opinion was very strongly expressed that the great objection to the clause is this,—that legislative sanction having once been given to the sale of poisonous articles by unregistered persons, there was no certainty that it would not, and no reason why it should not, be given to the sale of other poisons, *e.g.*, oxalic acid and some others, and so gradually extended to the whole Poisons Schedule.*

We are quite aware of the real purport of the second clause of the Bill and think we do not need much information about the real purport of any of the others, but did not think it either necessary or desirable to publish our opinions to all the world.

I should have thought that we, in this part of the country, who are accustomed to see them by hundreds of gallons, would hardly be supposed to labour under the "erroneous assumption that the particular articles to which the clause would apply are part of the materia medica which appertain exclusively to the arts of pharmacy and medicine." We do know a little more about them than to entertain such an idea, and though the business carried on by some of us is, unfortunately, of a mixed nature (very mixed), and we should probably be plucked for the Minor, or even the Modified, we do know that oil of vitriol, spirit of salt, aqua fortis and carbolic acid are not used exclusively in the practice of medicine and pharmacy, but are at least sometimes used in manufacturing processes.

I quite agree that it would have been desirable that an expression of opinion from this district "should have been supported by a greater number of those interested in the proposed legislation;" but people have to be thankful for small mercies sometimes, and it is just possible that a larger attendance might not have arrived at the same conclusion, for I have good reason to believe that many of those who stayed away are not merely "indifferent," but a good deal like the old apothecary spoken of by Mr. Giles, and have the same feeling towards the Pharmaceutical Society and all its acts as he had towards the College of Physicians; and, perhaps, do not quite see how a Bill, of which it is said, "that regard for the public safety is the only consideration upon which it can be submitted to the Legislature," should be considered necessary in the interests of pharmacy.

Manchester. W. Wilkinson.

[**** Our correspondent is over modest in being surprised that we should call attention to the proceedings of the Manchester Association, and he is uncharitable in forgetting that, editorially, we also have often to be thankful for small mercies. As regards the point upon which we appear to have incurred the displeasure of our Manchester friends, we do not, however, perceive any reason for altering our opinion as to their misconception, but of course we do not mean to insinuate that it is intentional.—Ed. Ph. Journ.]

* Mr. Frazer's remarks on this subject at page 868 deserve the very serious attention of every one interested in pharmacy.

Parrish's Syrup and Potassium Chlorate.

Sir,—Concerning Mr. Prosser's letter regarding the decolorizing effect of potassium chlorate on compound syrup of phosphate of iron, I beg to state that having made the experiment suggested in his paper I can only agree with his remarks to a certain extent.

I find if Squire's syrup be used no visible alteration takes place during a lapse of six hours, beyond the destruction of the characteristic bright appearance; if, however, the mixture be boiled for twenty minutes it assumes a dark flesh colour. Apparently this is due to the chloric acid, liberated by the free acid present, oxidizing the colouring matter of the cochineal, it behaving in a similar manner towards indigo and other pigments.

7, Poultry, E.C. William Thomas Deeks.

Sir,—The letter of Mr. T. H. Prosser, in the current number of the Journal, is an interesting comment upon the prevailing practice of preparing Parrish's syrup with hydrochloric acid. The fact that the *syrupus phosphatum compositus* being extremely liable, when manufactured on a large scale, to deposit considerably, has furnished the pretext, recommended originally, I believe, by Professor Parrish himself, for the production of a more elegant elixir by substituting for a portion of the free phosphoric acid, a more or less large proportion of HCl.

It is to the presence of this latter body that the decomposition, ascribed by Mr. Prosser to phosphoric acid, is due. Potassic chlorate and hydrochloric acid, dissolved in a large quantity of water, constitutes the well-known *mistura chlorinii acida*, which, besides its medicinal qualities, possesses in an eminent degree the powerful bleaching properties of chlorine.

On the other hand, dilute H_3PO_4 exercises no such undesirable action upon the chlorate; and if, in the case he has described, Mr. Prosser had employed a syrup prepared with this acid, and without the addition of HCl, he would have been spared the unpleasant *rencontre* with the prescriber to which he was subjected. Such a syrup, containing no hydrochloric acid and upon which $KClO_3$ exercises no inconvenient decolorizing powers, was fully described by Mr. S. Daniel, in a paper read at the London meeting of the British Pharmaceutical Conference, and which may be found in the published transactions of that body ('Year-Book of Pharmacy,' 1874, p. 596; and *Pharm. Journal* [3], v., 213).

I would like, ere concluding, to add that I heartily agree with the sentiment expressed in the last paragraph of Mr. Prosser's letter. I have, personally, always assumed that the reason Mr. Baldock's views had finally prevailed, and the 'Dispensing Memoranda' ceased to exist, was that recipes of a sufficiently difficult character had not been forwarded by correspondents to your office for elucidation.

Rock Ferry, Cheshire. J. E. Saul.

Assistants in India.

By the courtesy of Mr. Turner, of Great Russell Street, we are enabled to publish the following extracts from a private letter recently received, which throw further light upon the position of chemists' assistants in India:—

"With regard to myself I have no reason to regret coming out here; I am doing fairly well, with prospects of doing better, and am enjoying my usual good health.

"I had a liberal increase in my salary before I had been out six months.

"I have now got accustomed to the life in Bombay, and made a few friends, so that I am never at a loss to know how to spend an evening.

"When I came out I was put in charge of the laboratory and soda water factory, the former has been transferred to the opposite side of the "compound" to more convenient premises, and I have now got it nearly finished with all the latest improvements for carrying on laboratory work. The soda water factory also is a great item in the business. We have received lately one of Hayward and Tyler's largest and most improved soda water machines which works splendidly. I have over thirty men and boys to look after in my two departments.

"We have just finished another large warehouse specially built for drugs, druggists' sundries and patent medicines, and there is every probability of another one being erected, for the business goes on increasing wonderfully, so much so that five men have been brought out from home during the last twelve months.

"The assistants here are all on a very different footing to those at home; here you are practically your own master in your own department, and of course held responsible as such.

"I should not care to return to the life of an assistant at home again.

"We commence business at 8 o'clock; breakfast at 9 o'clock, and read the daily papers with all the latest intelligence; tiffin at 1 o'clock, to which we take one hour; at 4 o'clock we have a cup of tea and some toast; at 6 o'clock business is finished for the day. On Saturdays we close at 4, dinner at 8 o'clock.

"I joined the volunteers soon after I came out and find the Saturday afternoon parades great fun."

G. A. Paterson.—The subject of concentrated infusions was fully discussed in the earlier volumes of this Journal: see especially vol. xiv. of the first series. The varying results you speak of would appear to have been due to some irregularity in the mode of operating.

"*Herbalist.*"—(a) *Pedicularis sylvatica.* (b) *Chrysosplenium oppositifolium.* (c) *Caltha palustris.* (d) *Arum maculatum.* (e) *Stellaria Holostea.* (f) *Potentilla anserina.*

S. Grifith.—*Equisetum arvense.*

C. T.—*Ornithogalum nutans.*

Cerium.—No apparent decomposition takes place in this mixture; neither does it on standing show any tendency towards the disengagement of gas. Cold water should be used in dispensing mixtures with pulv. tragac. co.; the probable use of the starch is to separate the particles of gum and so facilitate the formation of the mucilage.

J. W. Aplin.—There should be no cloudiness or precipitation when liq. bismuthi is mixed with liq. magnesiæ, if both preparations used are according to the B.P.

Gulielmus.—When liquor bismuthi is ordered in a prescription the liquor bismuthi B.P., should be used. As the difficulty referred to does not occur with the B.P. preparation it needs no further remark. It is sometimes very difficult to determine the nature of the decomposition which takes place when a private preparation is used.

An Assistant (Leeds).—The prescriber has in this instance ordered for one pill the amount of ol. carui usually ordered for a dozen, and the dispenser must act accordingly.

U. A. Coates.—When tinct. quin. ammon. is mixed with plain or medicated water a separation of quinine takes place. If a little mucilage be previously added to the water the quinine will remain suspended in a finely divided condition, and there will be no aggregation of particles as a flocculent separation or as a precipitate.

P. H. and Novice.—A very suitable excipient for these pills is glycerine of tragacanth, made by mixing 1 part of powdered tragacanth with 6 parts of glycerine, allowing the mixture to gelatinize before it is used.

A. J. Rayson.—The disrespectful tone that pervades your letter throughout would render it unsuitable for publication, even if your complaints had a better foundation than they appear to have.

Pyrotechnist.—A recipe for making "Cheltier's Copper" will be found in vol. viii. of the present series of this Journal, p. 619.

F. C. S.—We are not acquainted with any such list.

H. Lambie.—Several communications on the preparation of koumiss have appeared in this Journal. See i., 865; iii., 544; iv., 692; v., 323. A recipe for making an imitation koumiss from cow's milk will be found in vol. ix., 1022.

Botanist.—The announcement for the Botanical Prize for 1884 will be found on p. 892 of this number of the Journal.

Blind.—It has not been published yet, but we hope to insert it in an early number.

Communications, Letters, etc., have been received from Messrs. Moon, Howie, Forrest, Saul, Colonial.

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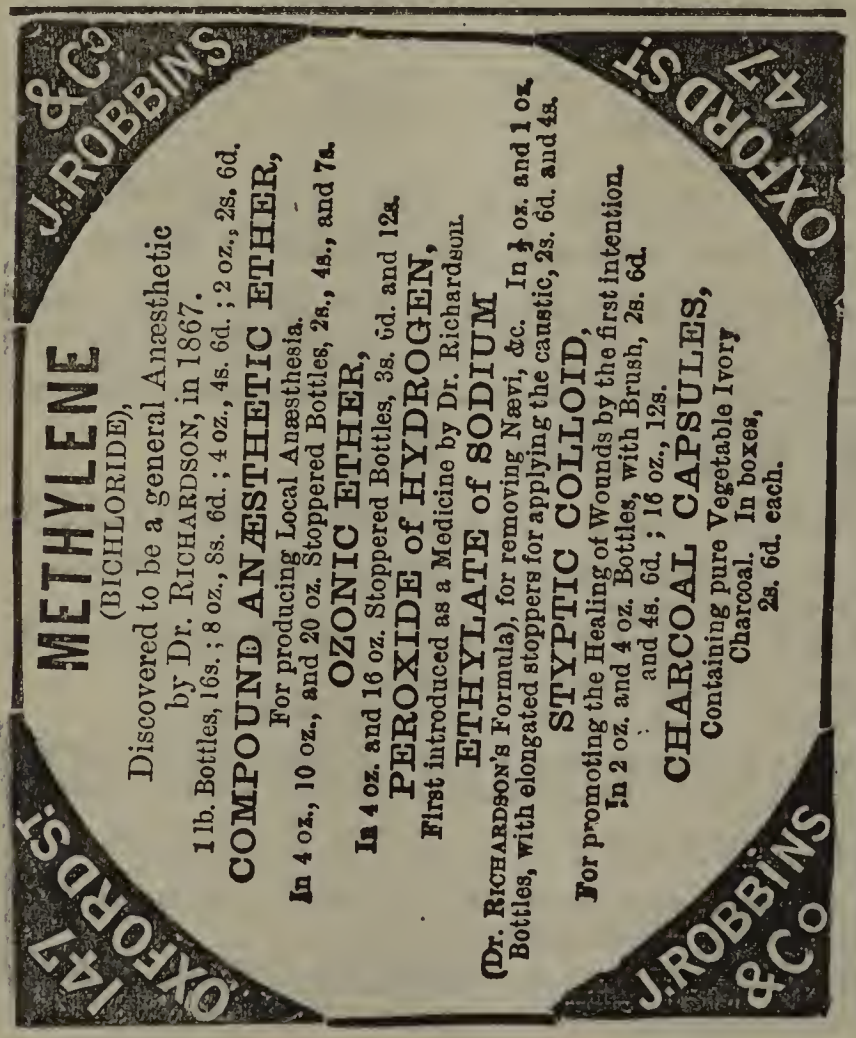

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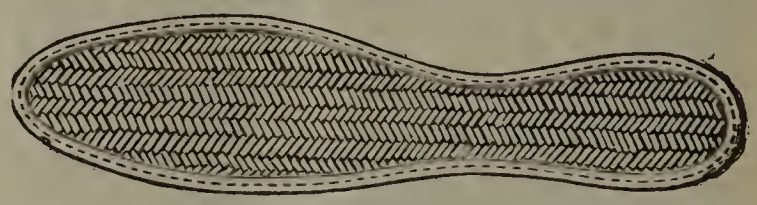

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FOURTEENTH SESSION, 1882-3.

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AS MANAGER of Branch. Age 30. Minor qualification. Registered Dentist. Married. Permanency preferred. J., 448, Southwark Park Rd., Bermondsey.

AS JUNIOR. 6 years' good experience. Short time for study. Height 5ft. 7in. Age 21. London or suburbs. Disengaged May 17th. A. E. COOK, 68, Devonshire Rd., Holloway.

AS JUNIOR. In London. Age nearly 21. 6 years' experience. Can Prescribe and Extract Teeth. Abstainer. Good references. S. N., 15, Somerset St., Barnsley.

AS ASSISTANT. In a good Dispensing business. Age 26. Height 5ft. 10in. West-end experience and reference. State full particulars. F. R., 70, Beaufort St., Fulham Rd., South Kensington.

TEMPORARY ASSISTANT or MANAGER. Registered Chemist. Long experience. Good references. Disengaged May 2. L. T., 141, Kentish Town Rd., N.W.

ENGAGEMENTS WANTED.

AS Dispenser to Surgeon or Hospital in London. Time for study in lieu of part salary. Good experience and references. Disengaged. Statim, Mr. Smith, Chemist, High St., Abingdon.

TO Apprentice a gentlemanly well educated youth (16), tall and of good appearance, to a Chemist. Has passed Preliminary exam. Moderate premium. Must be comfortable home. Address, E. Hughes, Antelope Hotel, Holywell, Flintshire.

AS Junior Assistant in good class business. Age 19 years. Height 5ft. 9in. Good reference. Disengaged. D. T., Lake St., Ferndale, Pontypridd.

WHOLESALE.—Re-engagement as Clerk or Warehouseman. Over 20 years' experience, and well acquainted with best markets. Hippo, 3, Bella Vista Villas, Upper Gordon Rd., Chase Side, Enfield.

TEMPORARY Manager. Steady and reliable. Accustomed to Dispensing and good-class Retail. Excellent references. R. S., 40, Camden Rd., N.W.

AS Temporary Manager. By the day or otherwise. Thorough experience. Now disengaged. Terms 6s. per day, 35s. per week. Chemicus, 3, Norfolk Ter., Shakspeare Rd., Herne Hill, S.E.

MANAGER or Locum Tenens. Age 40. Single. Registered A.P.S. Well experienced. Town or country. Chemist, care of Job Jones, Tattenhall, Chester.

PARTIAL employment. Either with Chemist or Surgeon. West-end experience. Good references. Age 23. Chemicus, 148, Sloane St., London, S.W.

IMMEDIATELY.—For 3 or 4 months. Minor qualification. Extensive town and country experience. Age 30. F. B. M., 8, Duchess St., Portland Pl., W.

AS Assistant or Second Assistant. Out-door. Age 24. 5ft. 8in. in height. 9 years' experience. Highest references. Disengaged. Permanency if possible. J., 36, Shelgate Rd., New Wandsworth, London.

TEMPORARY and Locum Tenens, for town or country. R. E. Bunn can arrange for future engagements. Full particulars on application to London private address: 12, Unity Pl., Woolwich.

AS Junior. 7 years' experience. Age 21. Height 5ft. 7in. For further particulars, C. H., 67, Victoria Dock Rd., London, E.

MANAGER of Branch or Locum Tenens. Immediately. 13 years' reference as Manager. Permanency desired. Prescribing business preferred. Age 38. Married, no family. J. T., 62, Westbourne Rd., Barnsbury, N.

AS Assistant in a good Retail and Dispensing business. Height 5ft. 8in. Age 21. 5 years' experience. Please give full particulars. A. L., Ashley House, Bournemouth.

AS Manager. Where the duties are light. Good references. Major qualification. Registered Dentist. South or West of England preferred. Salary not so much an object as a comfortable home. E. H., care of Mr. Ayscough Thompson, 22, Worship St., E.C.

AS Temporary Manager or Assistant. Many years' experience. Town and country. First-class references. Disengaged. W. B. Senior, Post Office, Winfrith, Dorchester.

AS Assistant in a good house of business. Minor qualification. R. Cubey, 19, Ravensbourne Ter., South Shields.

TEMPORARY. Ætat. 31. By day, week or month. Town or country. Thoroughly experienced in all branches. Irreproachable references. Terms very moderate. A. Wood, 4, Woodfield Cres., W.

ENGAGEMENTS WANTED.

AS Dispenser to a Surgeon. Where time could be allowed for study. Many years' experience in Dispensing. Good references. L. J., 452, Edgware Rd., W.

ASSISTANTS WANTED.

MR. FLOYD, Wholesale and Retail Chemist, Bury St. Edmunds, requires a qualified Assistant, who can travel and take the lead in the shop when required. Salary and commission. Out-doors. Permanent situation to a competent man. Send photo. and full particulars.

QUALIFIED Manager. Immediately. By a widow lady. Must have first-class references. One desiring a permanent situation preferred. State age, experience, salary required (in-door), and references, to No. 1292, care of Wyleys & Co., Coventry.

LATTER end of May.—For a permanency. In a first-class Retail business. A competent Assistant. Not under 25. Of gentlemanly manners and address, and thorough Counterman. Member of a Christian church preferred. Progressive salary, commencing at £70 per annum. Address, with carte, height, &c., to Alpha, care of Messrs. Baiss Brothers, 4, Jewry St., London, E.C.

COMPETENT Assistant. Age about 23. In-door. Only one kept. Apply, stating age, height, salary, reference, and enclosing carte (to be returned), to Charles Jones, Pharmaceutical Chemist, Birkenhead.

CHELTENHAM General Hospital and Dispensary.—A non-resident Dispenser for the Branch Dispensary. One with a certificate from the Pharmaceutical Society preferred. Attendance daily from 9 a.m. to 6 p.m., Sundays excepted. Salary £75 per annum. Applications, with testimonials, to be forwarded to the Hon. Secretary, not later than May 7th. Dated April 20th, 1883.

APPRENTICE.—Rupert H. Cumine, Chemist by examination, Woodgrange Rd., and Broadway, Forest Gate, E., has a vacancy for an intelligent, well educated youth, about 16, as an Apprentice for four years. Exceptional opportunities and home comfort. In a healthy locality. Reference to friends of present apprentice. Premium required, £80.

A COMPETENT Assistant. Accustomed to first-class Family and Dispensing business. About 25 years of age. To take charge during absence of principal, who resides away. Applicants forwarding full particulars will receive the same per return. Daniel Amos, Pharmaceutical Chemist, Canterbury.

AT once.—A steady obliging Junior, used to Mixed country trade. Reference and usual particulars may be sent to John Litchfield, Chemist, Longton, Staffs.

JUNIOR. For good class country trade. Must be neat and reliable, and have good reference. No Sunday duty. Hours 7.15 to 8. State age, height, and enclose carte, with name of reference. C. F. Smart, Chemist & Stationer, Littlehampton, Sussex.

H. BARTON, Pharmaceutical Chemist, St. Ives, Hunts, requires an Assistant. In-door. About 20 years of age. Accustomed to a country business. Applicants will please state usual particulars.

IMPROVER. A vacancy occurs in the establishment of a West-end Chemist for a young gentleman who has been in the business a year or so. Also one for a country agricultural business. Address, Portman, care of Messrs. Sanger & Sons, 489, Oxford St., London, W.

AN in-door Assistant. About May 12th. Must have good references. A total abstainer preferred. G.M., Messrs. Rew & Co., 273, Regent St., W.

AN Assistant. Accustomed to a good country business. Also an Improver. Apply, with references, stating age, qualification, salary required, if possible with carte, which shall be returned, Corfe, Chemist, Maidstone.

ASSISTANTS WANTED.

TO Chemists' Assistants.—A Wholesale House has a vacancy for an educated and intelligent young man, of good address, and with unexceptionable references, to assist in the Show Room. To save trouble, none need apply whose qualifications fall short of the foregoing stipulations. Address, by letter only, K. J. W., 36, Albion Grove, Barnsbury, N.

A PERMANENT Assistant, to Manage a Branch. Out or in-doors, at his option. Must be strictly steady. Apply to Mr. Gwilym Evans, Llanelly, South Wales.

A JUNIOR and an Improver for a light Dispensing business. Apply to Chemicus, 15, Broad Green, Croydon. Enclose photo., which shall be returned.

AN Assistant. Out-door. Applicants must give particulars of past experience. State precise salary expected, and enclose carte de visite. Roberts, Chemist, Newcastle-on-Tyne.

AN Assistant. Out-door. Must be a competent Dispenser. An abstainer preferred. Apply by letter, giving full particulars, D. P. Roberts, 46, North End, Croydon.

A COMPETENT Assistant. Accustomed to a first-class business and of good address. Age not over 30. State full particulars to T. Chase, Pharmaceutical Chemist, 151, Broad St., Birmingham.

SCARBOROUGH.—A gentlemanly Assistant. Well accustomed to first class Dispensing trade. Apply, with usual particulars, enclosing carte (to be returned), Clare & Hunt, Scarborough.

WHOLESALE Drug Trade.—An experienced and practical Laboratory Man. State salary, experience and full particulars (without which no application will be entertained), by letter only, to X. Y. Z., 5, Horton Rd., Hackney, London, E.

A SENIOR. Out-door. About 27 years of age. Must be a thoroughly competent Dispenser and neat writer. Apply, stating age, salary expected, and all previous engagements, to H. Thomas, Chemist, St. Leonards-on-Sea.

AN Assistant, to take occasional charge of the counter, and to render general help in a Mixed business. W. Price, 11, Witham, Hull.

APPRENTICE. In a good class Dispensing and Family Retail. Where the business would be thoroughly taught him. Comfortable home. Healthy neighbourhood. Premium moderate, and would be returned as salary under certain circumstances. For particulars, apply 6, Hawthorne Ter., Liscord, Birkenhead.

IMMEDIATELY.—Thoroughly competent Assistant. In-door. About 30. Send particulars, and state references, to Morris Banks & Co., High St., Birmingham.

AN Improver or Turnover in a good class country Retail and Dispensing business. Apply, stating age, reference and salary required, to William S. Bowler, Bridge St., Belper.

IMMEDIATELY.—A Junior or Improver for a good Retail and Dispensing business. State age, salary required, references, &c. Also an Apprentice, who has passed the Preliminary or its equivalent. Premium moderate. J. Williams, Pharmaceutical Chemist, Aldershot.

A COMPETENT Assistant, accustomed to town business. Must be quick and good Dispenser. One requiring a permanency preferred. Apply, with full particulars, to Shirtliff & Co., 65, Goldhawk Rd., Shepherds Bush, London, W.

ASSISTANTS WANTED.

A JUNIOR, of good appearance and manners. Apply, with carte (returnable), stating age, salary required, and references, to Foster & Else, 52, King's Rd., Brighton.

IN an inland watering-place, near London. A competent Assistant. Age about 23. Accustomed to a good class Family and Dispensing business. With unexceptionable references. Two kept. Apply to Messrs. Wright, Layman & Umney, 50, Southwark St., S.E. Communications not answered in 3 or 4 days declined.

A COMPETENT Assistant (two kept), who has been accustomed to first-class Dispensing and Retail. Apply, stating age, height, with usual particulars, enclosing carte. D. G. Gibbons, Pharmaceutical Chemist, 24, West St., Weston-super-Mare.

IMMEDIATELY.—An Assistant. Out-doors. Not under 21. In a Mixed country business. Apply, stating the usual particulars, to Spong & Son, Chemists, Biggleswade, Beds.

AN energetic Assistant, of good appearance. One well up in Retail and Dispensing good class business. No Sunday work, and a comfortable home. Age about 25 years. Pharmacy, 112, Green Lanes, Stoke Newington.

AN Assistant for a light Retail and Dispensing business. About 22 years of age. State height and salary required. Churchman preferred. To M., care of Messrs. Hodgkinson, 198, Upper Whitecross St., London, E.C.

AN Assistant (three are kept) for the Dispensing department. About 24 years of age. Accustomed to a good class business. Address, stating salary required and the usual particulars, to Messrs. Commans & Wilson, George St., Bath.

JUNIOR Assistant. Immediately. Out-door. Accustomed to general Retail and Dispensing business. Apply, stating usual particulars, terms and reference, enclosing carte (to be returned), to Wm. Smith & Co., Chemists, Western Rd., Brighton.

IMMEDIATELY.—An unqualified Assistant (Junior), who is used to Retail and is a good Dispenser. Apply personally (if possible), from 10 to 11, to Mrs. Williams, 2, Nottingham Pl., W., or by letter.

THE General Apothecaries' Company require a competent Junior Assistant (out-door), for their City branch. Apply personally to Mr. J. J. Pierce, 27, Bishopsgate St. Within.

AN Assistant (Junior). Duties principally in the Wholesale Dry Counter. In-door. Apply, stating full particulars, to Argles & Stonham, Maidstone,

A THOROUGHLY competent Assistant. Apply personally to Butler & Crispe, Chemists, 4, Cheapside, corner of St. Paul's, London.

JUNIOR Assistant. In-doors. Apply, stating age, height, reference, and salary required, to Mr. Pound, 60, Leather Lane.

A THOROUGHLY competent Assistant, age about 25, by J. Barnes & Son, Pharmaceutical Chemists, Preston, Lancashire.

AN Assistant. Minor qualification. Age about 24. Apply. by letter only, to Vines & Froom, 75, Aldersgate St., E.C.

A GOOD Junior. Accustomed to Dispensing and light Retail. Apply, with carte and particulars of experience, to J. Smithson, 1, Preston Rd., Brighton.

APPRENTICE.—S. Gill & Son, Pharmaceutical Chemists, have a vacancy for a well educated youth. Time allowed for study. Instruction given for Minor. Small premium. 57, Broad St., Pendleton, Manchester.

ASSISTANTS WANTED.

FOR the Continent—An ASSISTANT to an old established first class business. State, by letter, age and where last engaged. Personal interview will be required. Address to Z. Z., care of Messrs. Schrader & Co., Stationers, 31, St. Mary Axe.

IMMEDIATELY.—An ASSISTANT. About 23 years of age. Must be steady and obliging. Accustomed to country business. Hours light. No Sunday work. Apply, stating references, salary required, to FRANK BAKER, Sandwich, Kent.

A JUNIOR ASSISTANT, about 21 years of age, for a good country business. Must be a neat and accurate Dispenser. Apply, stating experience, height, salary required, and if convenient, enclose carte, to PHARMACIST, care of Messrs. Newbery & Sons, King Edward St., London, E.C.

AN ASSISTANT. In-door. For a light Retail and Dispensing business. Apply, stating usual particulars and salary required, to P. HALL, 118, Grey St., Newcastle.

JUNIOR ASSISTANT. About 21 years of age. Hours 8 to 8 alternately with 8 to 9. Little Sunday duty. Send height, references, salary, and enclose photo. THOMAS BAILEY, Coventry.

IMMEDIATELY.—Competent JUNIOR. Efficient to Dispense and willing to make himself generally useful. In a Mixed country business under a Manager. In-doors. Age, height, salary, references and usual particulars, to TWINBERROW & Co., Chemists, Worcester. Applications not answered in a week declined.

A COMPETENT ASSISTANT. In-door. For a light Retail and Dispensing business. Apply, stating usual particulars and salary required (photo. to be enclosed), to J. CORNELIUS, 11, Regent Pl., Teignmouth.

TO Pharmaceutical Students.—A DISPENSER wanted from 6 till 10 every evening. Apply to Dr. WILCOX, Dorchester House, Herbert Rd., Woolwich, S.E.

IMMEDIATELY.—JUNIOR or IMPROVER, with some knowledge of Dispensing, for Mixed country trade. Hours 7.30 to 8 alternately with 9. Little Sunday duty. Dissenter preferred. Small salary at first. State age and full particulars, salary, height, and photo., with references, to WILLIAMS, Chemist, Coleford, Gloucestershire.

IMMEDIATELY.—A qualified ASSISTANT, as Branch Manager for good class Retail. Apply, BUTLER & SON, Chemists, Sanvey Gate, Leicester.

AN ASSISTANT. Of gentlemanly appearance and address. About 26 years of age. Who has been accustomed to first-class Dispensing business. Apply, stating age, height, reference and salary required, and enclose carte (to be returned), to Mr. JAMESON, 48, Baker St., W.

WHOLESALE Invoice CLERK. Neat rapid writer. Shorthand preferred. Apply, A.B., care of Horner & Sons, Mitre Square, London, E.C.

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IN Lincolnshire.—An old established CONCERN. Returns good. Mixed trade. Plenty of scope for an enterprising man. May be had cheap. Apply, X. F., care of Sturton & Sons, Peterboro'.

GOOD class Retail, Dispensing and Prescribing BUSINESS. In the North of London. Capable of extension. Comfortable house. Held on lease. Rent low. Private entrance. Returns over £500. Price £500. A. Z., Messrs. Hill & Son, 101, Southwark St., S.E.

A DRUG and Dental BUSINESS. In the suburbs of London. Capable of improvement. Double-fronted shop. Lease 18 years. Price £450. Address, Messrs. WRIGHT, LAYMAN & UMNEY, 50, Southwark St., S.E.

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OLD established (28 years) Retail, Dispensing and Prescribing BUSINESS, with Dentistry. In a large Seaport (Eastern Counties). Death vacancy. Good opening for a persevering young man. About £200. No reasonable offer refused to an immediate purchaser. JAS. HOWELL, Walford, Ross, Herefordshire.

OLD established lock-up Chemist's BUSINESS. Established 50 years. Changed hands twice. Rent £28. Average returns about £500. Several Proprietary Articles. If purchased in 7 days will take £200. Proprietor wishing to get away at once. Address, C. D., Davy, Yates & Routledge, 64, Park St., London.

LANCASHIRE. Manufacturing town.—Old established Family, Dispensing, Retail BUSINESS. Returns £1400. No heavy trade. Good prices. Shop handsomely fitted in Spanish mahogany, double-fronted, plate glass. Good house and premises on lease at low rent. Every opportunity given for purchaser to investigate. It will be useless anyone applying who cannot command £800. Address, T. TRIPPIER, 79, Islington, Liverpool.

£210.—Chemists and Surgeons.—Gentleman having two BUSINESSES too far apart to work to advantage will sell either for 200 guineas. Valuation, or reasonable offer to an immediate purchaser. Either can be doubled by personal attention. Good houses; long and valuable leases. B., 138, Evering Rd., Stoke Newington, N.

LONDON.—Returning £900, but capable of doing more. Price £700; part cash and balance by easy instalments. Rare opportunity to good business man. Apply, BETA, care of Messrs. Davy, Yates & Routledge, 64, Park St., Southwark.

WEST of England.—Dispensing and light RETAIL. In fashionable inland watering-place. Large double fronted shop. Well fitted. Exceptionally good house. The returns are steadily increasing, and the business is open to close investigation. Returns £750. Price £750. Mr. BRETT, Valuer, Leicester.

BY tender (as a going concern), the BUSINESS of a Chemist and Druggist, carried on by B. Armstrong, at 9, Shield St., Newcastle-on-Tyne. The trade is purely Drugs, Dispensing and Prescribing, and is capable of great extension. Full particulars may be had on application to R. COOK WATSON, Accountant, 42, Mosley St., Newcastle-on-Tyne.

TO Doctors and Chemists.—An exceptional opportunity to purchase an old established BUSINESS in a very busy neighbourhood in the North of London. Price, including stock, £100, if sold at once. Death the cause of disposal. Also, first-class BUSINESS, in the same district. £300. Apply to WILLIAM JOHNSON & Co., 17, Ironmonger Lane, E.C.

WEST Midlands.—One of the oldest established RETAILS in the Midlands. Doing a good class trade. Fair Dispensing, with Agricultural and excellent Mineral Water trade. In prosperous town. Situation is of the best, and under energetic management returns, which are now about £2400, can be materially increased. The shop is unusually large and fitted by a London firm of repute. House is good. In present hands over 20 years. For sale now through ill-health. Applicants, with references, can have further details of Mr. BRETT, Leicester.

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THE proprietor of an old established and genuine Business, returning over £900 per annum, in an improving watering place, wishes an active PARTNER, with a view to succession. He must be prepared to invest £500 on entry, and a further sum by arrangement on succession. Apply, B. A., care of Messrs. Hunt & Co., Druggists, &c., Exeter.

A LIGHT, good class BUSINESS in a seaside watering-place, Sussex. Incoming £350, or best offer, as it must be sold. House small. Rent low, and can be covered by letting. Position good. Neighbourhood rapidly improving. Address, in first instance, PADWICK, Pharmacist, Redhill.

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Of Messrs. SMITH & SONS,

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The
Pharmaceutical Journal
AND
Transactions.

THIRD SERIES, No. 671.] SATURDAY, MAY 5, 1883. [PRICE FOURPENCE.

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Pharmaceutical Society of Great Britain,

17, BLOOMSBURY SQUARE, LONDON.

ELIAS BREMRIDGE, Secretary and Registrar.

NOTICES.

ANNUAL GENERAL MEETING.

Notice is hereby given that the forty-second Annual General Meeting of the Members and Associates in Business of the Society will be held at 17, Bloomsbury Square, Middlesex, on Wednesday, the 23rd day of May, 1883, at eleven o'clock in the forenoon for twelve *precisely*, to receive the Report of the Council, and to elect the Council and Auditors for the ensuing year.

By Order of the Council,
ELIAS BREMRIDGE, *Secretary and Registrar*,
17, Bloomsbury Square.

NOTICE of motion to be proposed at the Annual General Meeting of the Pharmaceutical Society of Great Britain, on Wednesday, May 23rd, 1883, by

GEORGE W. SANDFORD.

"That in the opinion of this meeting certain provisions set forth in the proposed Bill to regulate the Sale of Poisons and alter and amend the Pharmacy Acts require alteration, especially clauses 4 and 5, which render retail vendors of Patent or Proprietary Medicines who have not and cannot have any control over the required labelling of such medicines liable to prosecution for insufficient labelling, for which offence the proprietors only should be and can be made responsible."

INDEX TO THE PHARMACEUTICAL JOURNAL FROM JULY, 1868, TO JUNE, 1878.

An Index of the ten Volumes of the *Pharmaceutical Journal*, from July, 1868, to June, 1878, has been compiled and printed, price 2*s.* 6*d.*, or by post, 2*s.* 8½*d.* Each Member and Associate of the Society will be supplied with one copy *gratis*, on application to the Secretary.

THE JACOB BELL MEMORIAL SCHOLARSHIP.*
TENABLE FOR ONE YEAR.

TWO SCHOLARSHIPS are offered annually, and come into operation at the commencement of the Session in October. Candidates for these Scholarships must be Apprentices or Students of the Pharmaceutical Society, under twenty-two years of age, and have passed not less, or been engaged not less, than three years in the pharmacy of a Registered Pharmaceutical Chemist or Chemist and Druggist.

Each Scholarship is of the annual value of thirty pounds, and is to be held for one year. In addition to the Endowment, the Council provide free Laboratory instruction and admission to the lectures to the holders of the Bell Scholarships; and books of the value of five pounds, given by Mr. T. H. Hills, are divided equally between them.

The examination for these Scholarships takes place on the first Tuesday in July. Candidates desiring to compete must send notice to the Secretary, accompanied by Certificates of age and testimonials from their previous Employers or Masters as to capability, industry, and general conduct, on or before the first day of June.

Further particulars can be had on applying to the Secretary, 17, Bloomsbury Square.

* A scholar is supposed to be *commencing* his studies, or at least to have made only that progress which may be reasonably looked for during an apprenticeship. The object of the examination is to ascertain that the candidate has such an amount of ability, and affords evidence of having made such use of it in the acquirement of elementary knowledge, as will justify the expectation of his proving a successful student who may do credit to the appointment, and become a useful and accomplished member of the pharmaceutical body.

CATALOGUE OF THE LIBRARY.

Revised Catalogue of the Society's Library in London (1880), with the addition of a Catalogue of the Library at the North British Branch in Edinburgh, price 2*s.* 6*d.*, or by post, 2*s.* 10½*d.* A copy has been sent to each Member and Associate in Business of the Society. Each Associate and Apprentice of the Society will be supplied with one copy *gratis*, on application to the Secretary, 17, Bloomsbury Square.

Special Notice to Advertisers.—See page ii.

THE SCHOOL OF PHARMACY

OF THE

Pharmaceutical Society of Great Britain.

FORTY-FIRST SESSION, 1882-83.

SYSTEMATIC AND PRACTICAL BOTANY.

The Summer Course on Systematic and Practical Botany commences this (Saturday) Morning, May 5th, at 8 o'clock, in the Gardens of the Royal Botanic Society, Regent's Park, and will be continued on the succeeding Friday and Saturday Mornings, at the same hour, until the end of July.

Application for Admission to the School, for Prospectuses, or for further information, may be made to the Professors or to their Assistants in the Lecture Room, or Laboratories, 17, Bloomsbury Square, London, W.C.

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RICHARD BREMRIDGE, 17, Bloomsbury Square.

NOTICE TO ADVERTISERS.

THE PHARMACEUTICAL JOURNAL of MAY 26 will contain—

The Report of the Annual Meeting of the Society.
The Result of the Election to the Council.
Notices of the Annual Dinner, Conversazione, &c.
The Report of the Annual Meeting of the Chemists' and Druggists' Trade Association.

Advertisements for this important Number should be forwarded without delay. No extra charge, the terms being the same as for ordinary issues.

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ELECTION OF COUNCIL.

ADDRESS TO THE ELECTORS.

GENTLEMEN,—In asking for your votes to enable me to represent you on the Council, a few words may not be out of place as to my reasons for coming before you. First, then, I regret to find that the Pharmaceutical Society so inadequately represents the trade generally. The causes of this are various, but I hold that before any real good can accrue to the chemists of England, they ought to be able to act together as a homogeneous whole, and not in sections, and that it ought not to be longer possible to speak of "insiders" and "outsiders." I believe the main cause of this distinction to have been the fact that the Society has been chiefly represented either by London men, or by men whose businesses resemble closely those conducted in London. It follows of necessity, that as town and country businesses are totally dissimilar, laws and regulations which are good for the one are wholly inapplicable to the other. I think that a remedy ought to be provided for this state of things, and I should be prepared to support any well-considered scheme having this object in view. Secondly, I consider that the present year may be an epoch in the history of English pharmacy, by reason of the proposed new Act, with the greater part of which I cordially agree, and hope nothing may prevent its becoming law. Should it do so, it will undoubtedly place chemists in a better position than they have been in for a long time, in several important respects. Doubtless, one or two of the clauses would be better for some amendment, and I should be prepared to support any such amendments, having for their object the benefiting of the trade generally. Lastly, I consider the present free trade in medicines to be altogether anomalous, and fraught with great evils, if not positive danger, to the public; this, too, ought to be remedied. And if the chemists of England would but speak with united voice, and in no uncertain sound, through their representative, the Pharmaceutical Society, I feel sure some good would be the result. But to effect this, minor interests and differences of opinion must be for the time sunk, in deference to the common good. In conclusion, I have only to add that, should I be returned, the electors may at all times depend on my influence being used in their behalf.

I remain, gentlemen,

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TO STUDENTS.

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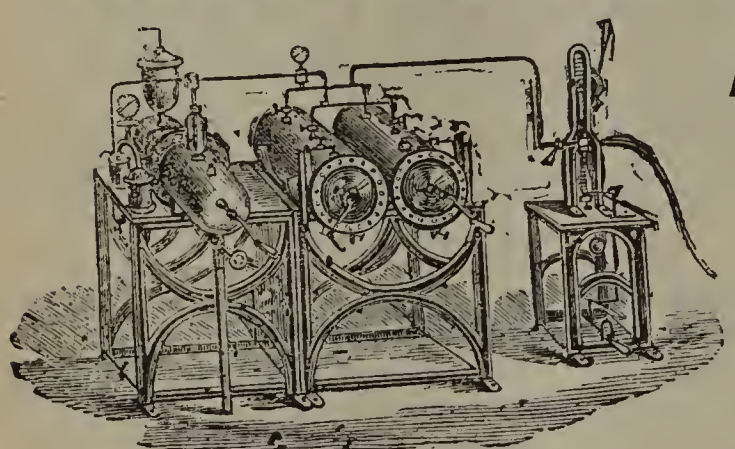

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CAUTION.—Circumstances which have come to the knowledge of Andreas Saxlehner, Buda Pest, Sole Proprietor of the Hunyadi János Spring, compel him to WARN the British Public against SPURIOUS IMITATIONS. To secure genuineness, purchasers should see that every bottle has on the LABEL the name of

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FREDERICKSHALL (5 Cases, 6d. per Case less), 28/6 Case, 30 bots.; 40/- Case, 60 ½-bots.
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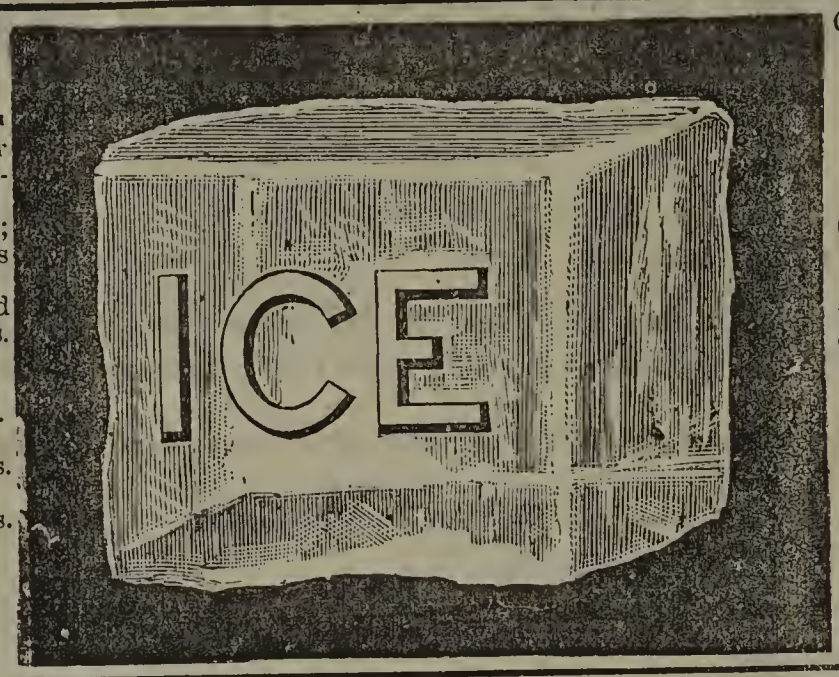

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Original Blocks, 2s. per Cwt.
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Low quotations given for quantities taken from vessels while discharging.
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Guaranteed to contain Mushrooms, in Casks as under—

9 gals.	...	...	1/3 per Gallon.
18 ,,	...	...	1/2 ,, ,,
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60 ,,	...	...	11½ ,, ,,

WORCESTERSHIRE OR YORKSHIRE SAUCE, IN CASKS, ANY SIZE.

No. 1 Quality	...	...	2/- per Gallon.
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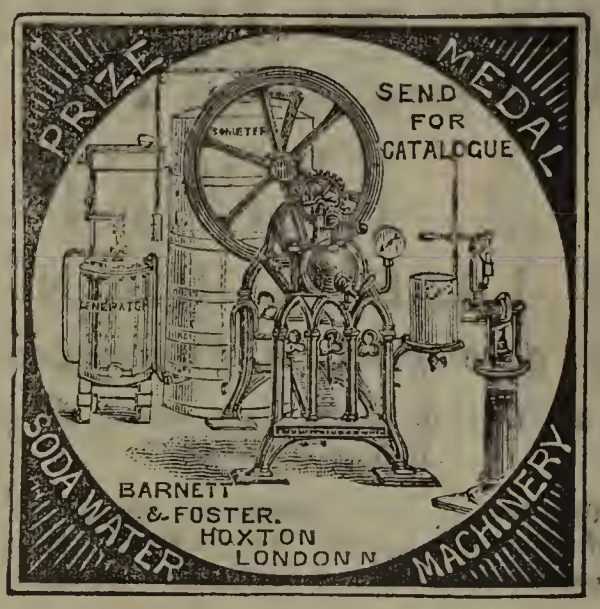

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NECTAR,

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FRUIT CHAMPAGNE, &c.

Prize Medals: London, 1862, 1873, 1874; Vienna, 1873; Philadelphia, 1876; Cape, 1877; Paris, 1867, 1878; Highest Award, Sydney, 1879-80.

The Chemist who enters into the enterprise of manufacturing Aërated Drinks (with properly-constructed Machinery) in any districts where they are required, renders a real service to the public, and no business offers him a better return for a comparatively small outlay.

Our Machines are universally adopted throughout the world for the manufacture of all kinds of Aërated Drinks, whether in bottles, syphons, or counter fountains. There are in England alone over 2,000 factories where our Machinery is in use. They are the simplest, safest, and cheapest for the purpose, and produce a highly charged gaseous water free from metallic or foreign contamination.

All our Machines have a Gasometer, and it forms a most important necessity where purity of product is required, as in this the gas is expanded and purified; it also removes the possibility of accidents by explosion, and avoids the necessity of complication—these we consider of greater importance than the saving of a few inches of floor space.

These are the same for any size Machine.

No. 1, to make	700	doz. Botts. per day	...	£70	0	0	Bottling Apparatus for Corked Bottles	...	£9	9	0
No. 2,	„	500	„	„	„	...	65	0	0	„	„	for Codd's Patent Bottles, with Syrup Pump	...	10	10	0
No. 3,	„	400	„	„	„	...	60	0	0							
No. 4,	„	300	„	„	„	...	55	0	0	„	„	with Syrup Pump for Champagne Bottles	...	20	0	0
No. 5,	„	200	„	„	„	...	50	0	0							
No. 6,	„	100	„	„	„	...	30	0	0	„	„	with Syrup Pump for Syphon Bottles	...	14	14	0

The above quantities are for Lemonade and other Saccharine Drinks; if for Splits, reckon double; if for a very highly charged Soda Water, reckon half.

These Machines are all packed without taking apart, and can be set to work immediately on arrival. Many of these Machines have been in constant use for forty years without requiring any repairs. Recipes and every information given for manufacturing all the above Drinks, so that the most inexperienced can at once produce Waters of the highest class. **Inventors of Fruit Champagne. Sample Case, containing 1 dozen, forwarded for 6s. 6d.**

OBSERVE!!—It is important that the Machines for the manufacture of Aërated Water should be of the very highest class, to produce the best results; and it is ill-timed economy to be tempted into buying cheap and worthless machinery, which is liable to get out of order soon, besides making very indifferent Waters. Purchasers must not overlook the fact that Soda Water Machines, like watches, can be made at any price.

THE "LONDON-MADE" SYPHON BOTTLE.

PRICES:

Quart size, 22s. per doz. } *by the*
Pint „ 21s. „ } *gross.*

No charge for packing if ordered in Bin Cases, 2s. 6d. each, holding 1 dozen.

The high reputation this bottle has achieved is due to the fact of its being in every particular the most perfect yet introduced, and when compared with others in the market it stands pre-eminent. It is the most simple in its working parts, therefore the least liable to get out of order; it is the most easily opened, the lightest pressure on the handle being sufficient; it produces a more highly charged gaseous water than is usually obtained from syphons; it compares most favourably in appearance with any, and the metal top being entirely free from lead, the prejudice against syphon drinks is at once removed, as the liquid passes over pure tin only.

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WHOLESALE & EXPORT DRUGGISTS,

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Manufacturers of all descriptions of Pharmaceutical Preparations,

Beg to inform Merchants, Shippers, &c., that all Indents entrusted to them will receive careful attention and prompt execution.

Messrs. B., S. & Co. request the attention of their friends and the Trade, at home and abroad, to their having PURCHASED THE BUSINESS of Messrs. JAMES BASS & SONS, Hatton Garden, and with it the various formulæ from which their Special Preparations have been made, and pledge themselves to supply them in all their integrity.

Specimens of these Preparations have remained in the Museum of Kew Gardens during 23 years without deterioration.

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A POSITIVE CURE FOR STOMACH, LIVER & KIDNEY AFFECTIONS.

The Only Palatable Natural Aperient Water.

THE BEST HOUSEHOLD REMEDY & SPECIFIC FOR CONSTIPATION

Highest Award at the International Medical Exhibition, 1881. Retail 1/6 & 2/- per Bottle.

A SUPPLY OF CIRCULARS WITH NAME AT FOOT AND DESCRIPTIVE PAMPHLETS FREE ON APPLICATION.

Chemists can safely stock this Water, as it will continue to be well advertised.
It is prescribed by all the leading Medical Men.

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Since the introduction of Pepsine by BOUDAULT and Dr. L. CORVISART, BOUDAULT'S Preparations have been considered the most reliable.

BOUDAULT'S PEPSINE.

The Paris Hospitals have used no other.

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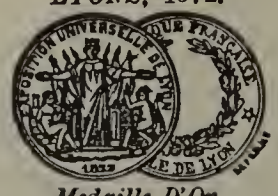

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BOUDAULT'S PEPSINE—dose, 5 to 10 grains—in bottles, one ounce, 5/-; in bottles, half-an-ounce, 3/-

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The Burroughs Inhaler

"Is an ingenious and convenient device for inhaling chloride of ammonium fumes; by its use the chloride of ammonium is brought in more intimate contact with the mucous surfaces of the passage of the nose and throat than by any other form of inhaler."—*The Medical Press and Circular* Reports.

For full Notes and Reports see front pages of *The Lancet*, March 31st.

Kepler Extract of Malt.

THE LANCET says of the Kepler Extract of Malt: "The best known, and in this country the largest used Extract of Malt. It is as distinct an advance in therapeutics as was the introduction of cod-liver oil. It is one of our best remedies for atonic dyspepsia, and is undoubtedly useful in consumption and other wasting diseases." And further adds, "It is very good, and may be used with confidence."

For wasting diseases.

For full Notes and Reports see front pages of THE LANCET, March 31st.

McK. & R. Capsuled Pills.

An important improvement has been made, which now renders the most offensive and repulsive drugs easy of administration. This improvement consists in perfectly sealing with a thin transparent capsule of gelatine all drugs such as quinine, morphia, rhubarb, &c., also the various pills and powders of the Pharmacopœia. These capsules are of an ovoid shape, and it has been demonstrated beyond question that when ordinary coated pills are rejected by patients there is not the slightest difficulty in administering this new form.

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Kepler Cod-Liver Oil with Extract of Malt.

This is an emulsified combination of the purest fresh Norwegian Cod Liver Oil with 50 per cent. of Extract of Malt (Kepler).

So combined, the oil is sub-divided into minute particles which can be seen under the microscope to be as fine as the granules of milk; and so much finer than any that can be obtained by any emulsion with gums. On the fineness of the emulsion depends the digestibility of the oil. "The digestive change undergone by fatty matters in the small intestine consists mainly in their reduction into a state of emulsion, or division into infinitely minute particles."

For full Notes and Reports see front pages of *The Lancet*, March 31st.

The Burroughs Beef and Iron Wine.

"This is a really valuable preparation, and, as far as we know, a novelty. It contains beef-juice and citrate of iron in solution in wine, and is therefore a very powerful and rapidly-acting tonic. Children, as well as adults, take it easily; and, as its taste is by no means unpleasant, it can hardly fail to attain great popularity. In many cases of scrofula and rickets we have given it with the most gratifying results."—*The Lancet* Report.

For full Notes and Reports see front pages of *The Lancet*, March 31st.

Lawton's Absorbent Cotton

"Has been pronounced by some of our most eminent surgeons the very best absorbent for taking up discharges; it is very fine and soft, and acts instantly."—*The Medical Press and Circular.*

For full Notes and Reports see front pages of *The Lancet*, March 31st.

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EXACT SIZE OF TABLET.

"Are a great improvement on the hard, unpalatable lozenges which have so long done duty in the Pharmacopœia. The Chlorate of Potash and Chlorate of Potash and Borax will be found useful in throat affections, whilst the Bicarbonate of Potash and Bicarbonate of Soda Tablets will prove efficacious in dyspepsia. The Soda Mint, or Neutralising Tablets, will earn the gratitude of many a flatulent dyspeptic"—*The Lancet.*

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Hazeline.

The Medical Press and Circular reports:—"Hazeline is a valuable astringent remedy, wonderfully efficacious in checking *internal* or *external hæmorrhages*, and for *allaying inflammation.* It is particularly valuable in the treatment of *bleeding piles*, and as a *surgical dressing* it deserves attention."

For full Notes and Reports see front pages of *The Lancet*, March 31st.

The Wyeth Soluble Compressed Hypodermic Tablets.

The following formulæ and combinations embrace all those in general request. Others will be added as the demands of the profession warrant.

We claim for the Wyeth Hypodermic Tablets:

Absolute Accuracy of Dose.
Ready and Entire Solubility.
Perfect Preservation of the Drug.

Their convenience and utility will at once be apparent on examination.

Morphiæ Sulphas ....1-3 grain.	Morphiæ Sulphas ....1-8 grain.
Morphiæ Sulphas ....1-4 grain.	Atropiæ Sulphas .... 1-200 grain.
Morphiæ Sulphas ....1-6 grain.	Morphiæ Sulphas ....1-12 grain.
Morphiæ Sulphas ....1-8 grain.	Atropiæ Sulphas ....1-250 grain.
Morphiæ Sulphas ....1-12 grain.	Atropiæ Sulphas ....1-60 grain.
Morphiæ Sulphas ....1-3 grain.	Atropiæ Sulphas ....1-100 grain.
Atropiæ Sulphas....1-120 grain.	Atropiæ Sulphas ....1-150 grain.
Morphiæ Sulphas ....1-4 grain.	Strychniæ Sulphas ..1-60 grain.
Atropiæ Sulphas ....1-150 grain.	Strychniæ Sulphas ..1-100 grain.
Morphiæ Sulphas ....1-6 grain.	Strychniæ Sulphas ..1-150 grain.
Atropiæ Sulphas ....1-180 grain.	

For full Notes and Reports see front pages of *The Lancet*, March 31st.

The Wyeth Dialysed Iron.

1. It is easily administered, the dose being very small.
2. It has no unpleasant taste or smell.
3. It does not irritate the stomach.
4. It has no effect on the bowels, producing neither constipation nor diarrhœa.
5. It does not blacken the teeth.

In ordering please specify Fer. Wyeth 3 oz. with Dropper.

NOTE.

All the articles mentioned on this page may be obtained from respectable Dispensing Chemists and Wholesale Druggists in every part of the world, or from the European Depôt of Burroughs, Wellcome & Co., Snow Hill, London, E.C. Our new Formulæ Book and Trial Specimens of any of our Preparations will be sent to any Member of the Profession upon request.

BURROUGHS, WELLCOME & CO., Manufacturing Chemists, Snow Hill, London, E.C.

RESULTS OF THE ANALYSIS OF SAMPLES OF CINCHONA BARK GROWN IN JAMAICA.

BY DR. B. H. PAUL.

It having been considered desirable that analyses should be made of the samples of Jamaica cinchona bark, presented to the Museum of the Pharmaceutical Society by the Colonial Office, portions of these samples were placed in my hands for that purpose, and the following table gives the results arrived at.

It will be seen that there is some considerable difference between these results and those referred to by Mr. D. Morris in his notes,* as having been obtained by Mr. John Eliot Howard, and to some extent this is to be accounted for by the fact that the samples analysed by Mr. Howard two years ago were specially selected samples of the richest part of the lower trunk, while those recently presented to the Museum are a fairer average representation of the bark product for sale in Jamaica. This is especially the case as regards the sample of "officinalis," as I have had opportunity of ascertaining by a comparison of my results with those obtained by the analyses of a parcel lately sent over from Jamaica.

	Variety of Plant.	Kind of Bark	Quinine.	Quinidine.	Cinchonidine	Cinchonine.	Amorphous.	Total.
1	*Cinchona officinalis* .	Trunk .	3·74	0·04	1·77	0·23	0·30	6·08
		Twig . .	1·08	trace	·37	·60	·20	2·25
		Root . .	2·90	1·01	·67	4·60	·58	9·76
2	*Cinchona succirubra* .	Trunk .	2·04	·13	2·58	2·45	·50	7·70
		Twig . .	·78	—	·47	·23	·29	1·77
		Root . .	1·76	·34	1·39	4·40	·90	8·79
3	Hybrid?	Trunk .	2·47	—	2·24	·90	·52	6·13
		Twig . .	1·00	—	·87	·40	·36	2·63
		Root . .	2·45	·57	2·02	3·54	·56	9·14
4	*Cinchona Calisaya* .	Trunk .	·34	·23	·82	·82	1·80	4·01
		Twig . .	—	—	—	—	—	1·30
		Root . .	trace	4·07	·45	1·80	·65	6·97
6	*Cinchona micrantha* .	Trunk .	1·13	·30	·67	3·24	·68	6·02
		Twig . .	·43	—	·28	·60	·50	1·81

The data in the foregoing table are also interesting in some other respects: thus, for instance, the large proportion of quinidine in the root bark of the "calisaya" sample is quite exceptional, and taken together with the small amount of quinine may perhaps be evidence of unhealthy growth or of the influence of unfavourable conditions of soil or climate. This small amount of quinine may, however, be due to the circumstance, referred to by Mr. John Eliot Howard at the Linnean Society last Thursday evening, that the plants sent to Jamaica as "calisaya" were really plants of *C. micrantha*, var. *Calisayoides*, instead of the true *Ledgeriana*, characterized by the large amount of quinine contained in the bark. Again, the amount of quinine in the "succirubra" sample shows that there is a very good type of this cinchona being cultivated in Jamaica.

While referring to these analyses it may perhaps be useful to publish some analyses made by me in 1878 of some of the first samples brought from Jamaica by Mr. R. Thomson. These samples were all very thin and green, probably having been taken from very young trees. The results furnished by the dried bark are as follow.

A comparison of these results with those furnished by the samples of bark presented to the Society's Museum shows such differences as may be taken to justify the inference that with further growth there has been in most instances an improvement in the quality of the bark. In the "succirubra" samples there is on the average more than twice the amount of quinine, and in the "officinalis" samples there is a considerable increase. In the case of the samples represented as "calisaya," however, the reverse is the case and this may be due to the bark having been derived from different varieties of that species.

	Quinine alkaloid. Per cent.	Cinchonine alkaloid. Per cent.	Cinchonidine alkaloid. Per cent.	Moisture. Per cent. in bark as received.
1 *Species uncertain*	0·95	0·20	1·39	34·7
2 *Succirubra*— From bridge at old foundation	0·98	1·30	2·92	10·0
3 *Succirubra*— From Latimore River	1·23	4·24	1·88	10·25
4 *Calisaya*— Facing William "Puv" (*sic*)	2·52	Traces.	4·04	11·25
5 *Officinalis*— Latimore River	2·27	0·20	5·46	8·50
6 *Officinalis*— From Monkey Hill	2·77	Traces.	0·58	13·0

* *Ante* p. 802.

EXPLOSIVES AND MATERIALS FOR EXPLOSIVES.

A copy of the following Circular, addressed to local authorities under the Explosives Act, has been forwarded from the Home Office, by direction of Sir William Harcourt, Secretary of State for that department, with a request that it might be published in the *Pharmaceutical Journal*:—

"Home Office,
"18*th April*, 1883.

"Sir,—I am directed by the Secretary of State to inform you that it appears to him desirable that the attention of the local authorities and of the police should be directed to the importance of exercising special and vigilant observation with a view to preventing the acquisition by persons for unlawful objects not only of explosives adapted for such purposes, but of the materials with which, if possessed of a little technical knowledge, they would be able to manufacture explosives.

"With a view to assisting you in exercising such observation, I beg to enclose a memorandum which has been drawn up by H.M. Chief Inspector of Explosives, and which enumerates the more important of the materials which are capable of being more or less readily applied to the production of explosive.

"It would be desirable that you should take immediate steps to bring this circular under the notice of all pharmaceutical chemists, chemists and druggists, drysalters, oil and colourmen, and manufacturers of or dealers in chemicals within your jurisdiction, and otherwise obtain for it such publicity as may be practicable in order that any suspicious cases of purchase or possession may be promptly brought under the notice of the police.

"I am at the same time to call your attention to certain provisions of the Explosives Act, 1875, *e.g.*, section 69, which directs that 'It shall be the duty of every local authority to carry into effect the powers vested in them under this Act,' and to the powers of appointing officers (sections 69 and 75), and the considerable powers of search and seizure conferred by sections 73, 74, and 75. You will not fail to observe that section 73 gives a power to search for ingredients of an explosive as well as for the explosive itself, while the Explosive Substances Act, 1883, which incorporates the same powers, extends them to the search for and seizure of any apparatus for firing explosives.

"Section 23 of the Explosives Act, 1875, imposes upon the occupiers of factories, magazines, stores, and registered premises the obligation of taking all due precautions for preventing unauthorized persons having access to the factory, magazine, or store, or to the explosive therein or in the registered premises, and attention should be at once called to any case in which it may appear to the local authority that this obligation is imperfectly discharged. The local authorities should also require their officers to direct the particular attention of the occupiers of all stores and registered premises within their jurisdiction to this obligation.

"I am also to insist upon the importance of the local authority availing themselves of the powers which the Explosives Act of 1875 confers upon them of appointing competent officers to carry out the Act within their jurisdiction; and these officers should be enjoined to direct their particular attention to the prevention by every means in their power of the illegal manufacture and possession of explosive.

"I am to add that a reward of £100 will be given to any person (other than a person belonging to a police force in the United Kingdom) who furnishes information which may lead to the discovery and conviction of any person who may be engaged in the illegal manufacture of explosive, in any case in which it is shown to the satisfaction of the Secretary of State that such illegal manufacture constituted a serious infraction of the law, and was being carried on for a criminal purpose.

"I am, Sir,
"Your obedient servant,
"A. O. F. LIDDELL."

"*Memo.*

"Independently of the purchase of explosives (such as dynamite, blasting gelatine, guncotton, tonite, potentite, and detonators) specially adapted for blasting, and therefore generally available for destructive purposes, by persons who may not be reasonably supposed to require the same for industrial objects, suspicion should attach to the acquisition in notable quantities of all or any of the materials adapted for the making of explosives when the person seeking to purchase the same is unknown to the seller, or is not known to require such materials for trade purposes or other legitimate use.

"Among the substances which fall within this category may be specially enumerated the following:—

- Nitric acid, Sulphuric acid } especially in their more concentrated forms.
- Glycerine.
- Saltpetre.
- Chili saltpetre (nitrate of sodium).
- Chlorates (especially chlorate of potash).
- Picrates.
- Picric acid.
- Phosphorus.
- Iodine, Metallic mercury, Nitrate of mercury } Even in comparatively small quantities.
- Orpiment.

"V. D. MAJENDIE, *Colonel*,
"*H.M. Chief Inspector of Explosives.*"

DEODORIZED COD LIVER OIL WITH IRON.*

BY W. A. HENRY.

Take of—

Cod liver oil	1 pint.
Sulphate of iron, dried	64 grains.
Castile soap, powdered	128 grains.
Charcoal, powdered	1 ounce.
Coffee, ground	½ „
Or,	
Chocolate, powdered	¼ „
Hot water	q.s.

Dissolve the sulphate of iron and Castile soap, each separately in a sufficient quantity of hot water, mix the two solutions, and after washing the resulting precipitate (oleate of iron) with water, triturate the oleate in a mortar with the cod liver oil (previously heated in a water-bath) gradually added; then the remaining ingredients, subject the whole to a water-bath for an hour, and filter, while hot, through paper or flannel.

The oleate of iron, which each tablespoonful of this preparation contains, is equivalent to nearly 1 grain of the sulphate of iron. To increase the quantity of iron in the above formula, twice the amount of the sulphate and soap may be used; the preparation would then contain oleate of iron equivalent to nearly 8 grains of sulphate of iron to the fluid ounce, or 1 grain to a teaspoonful, the latter modification being adapted to the administration of small doses of the oil.

The preparation has a dark brown, almost transparent appearance, the oleate of iron combining readily with the warm oil. It retains only a faint odour of cod liver oil, the charcoal assisting as a deodorizing agent, and the chocolate or coffee adding flavour to the same. It has the advantage of being acceptable to persons who would reject the oil in its unmodified form.

* From *New Remedies*.

The Pharmaceutical Journal.

SATURDAY, MAY 5, 1883.

Communications for the Editorial department of the Journal, books for review, etc. should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE MEDICAL COUNCIL AND PHARMACOPŒIA REVISION.

WE learn from the medical journals that the British Pharmacopœia is again to be placed upon the stocks, for repair of such dilapidations as in the lapse of time naturally result from the progress of knowledge rather than any other cause. The sixteen years that have passed since the work was last in hand have been so fertile in additions to our chemical science, to our materia medica, and in applications of science for the purposes of medicine and surgery, that it is full time the standard authority in accordance with which pharmacists are bound to regulate the execution of their duties should be brought to the level of the time.

The responsibility of carrying out this work from time to time is by law entrusted to the General Medical Council, and although that body as at present constituted has probably but a brief existence to look forward to, it has been deemed expedient in the face of that prospect to provide for the preparation of a new edition of the Pharmacopœia. The Committee appointed last July for this purpose consisted of Drs. QUAIN, AQUILLA SMITH, PITMAN and HALDANE, and Messrs. COLLINS, BRADFORD and MACNAMARA. At its first meeting a Sub-Committee was empowered to take such steps as were thought necessary towards preparing the new edition and to report thereon. At the late meeting of the Medical Council the Pharmacopœia Committee presented a report, showing that the Sub-Committee had communicated with Professors REDWOOD, BENTLEY and ATTFIELD, as to undertaking the duty of preparing a new edition of the Pharmacopœia under the direction of the Committee; that these gentlemen had submitted a report which, subject to certain modifications recommended by the Sub-Committee, had been approved of, and that an arrangement had been made to pay them a sum of £800 as their remuneration for the work of carrying out any experiments required, correcting the press, and preparing an index to the satisfaction of the Committee.

From the report of the Professors it appears that the negotiations relating to this arrangement have been in progress since last November, and that some time prior to the date of the report, the Pharmacopœia Committee had given instructions for the work of revision to be proceeded with. The Professors then go on to explain such changes as they think requisite, and assuming the general arrangement of the matter in the Pharmacopœia to be satisfactory they direct attention mainly to chemical nomenclature and notation, and to the mode of representing quantities of ingredients in preparing medicine. The recommendations in regard to the former subject embody the views propounded some years ago by Professor ATTFIELD and subsequently adopted in the United States. It is also proposed to discontinue the use of symbolic notation according to the old system, and to indicate that chemical formulæ have a somewhat qualified meaning in regard to the commercial forms of such articles as cream of tartar. This will, perhaps, be of benefit to public analysts afflicted with a mania for impossible purity, and it may be useful in preventing them from troubling without reason.

In regard to the subject of proportional weights reference is made to the comments upon it in the preface to the Pharmacopœia, and the reasons there given for not adopting the metric system as being in their general bearing applicable now with almost as much force as when they were written; but with the view of facilitating and promoting the more general use of metric weights and measures it is suggested that proportional parts should be substituted for specific weights and measures wherever it be applicable in the description of processes. It is not recommended that this change should be carried so far as to adopt parts by weight for liquids as well as solids, as has long been the case in Germany and is now in the United States, but it is thought that, with few exceptions, parts might be substituted for specified weights and measures with advantage, the term "parts" being used to represent parts by weight, and the term "fluid parts" to indicate the volume of the specified number of parts of the same value of water. This method of representation will be adopted side by side with the present method in the new edition of the Pharmacopœia, and it will thus be seen that in describing or interpreting a process by the new method, all the proportional numbers applied to the process must refer to one and the same denomination of weight or measure. It is pointed out that in the great majority of cases the quantitative relation of ingredients in the processes is simple, and the application of the new method would be obvious and easy; but some processes would require to be reconstructed and, in a few instances, it will be necessary to make a slight alteration in the proportions of the ingredients. The only cases in which the method is inapplicable are those of the enemas and inhalations, and the formulæ of these will be left as exceptions to the general practice.

The advantages anticipated from the adoption of this method are—that the use of proportional numbers will tend to the simplification of proportions in

compounded medicines; that the proportions given being equally applicable to either of the two systems of weights and measures, a way will be opened to the more general use of the metric system; that the processes of the B.P. will be more intelligible to medical men and pharmacists abroad who are accustomed to use the metric system exclusively; and that thus provision will be made for the assimilation of medicines bearing the same names in different Pharmacopœias.

So far as relates to the introduction of new drugs or preparations, and the elimination of any that have proved to be unnecessary, the report of the professors witholds any opinion as to specific articles until opportunity has been offered for investigation and consultation with the Pharmacopœia Committee and with such medical and pharmaceutical authorities as it may think should be consulted. A more decided view is expressed on the alteration of processes, as well as of descriptions and definitions of substances, and it is justly stated that in this direction there is room for improvement involving much experimental work. The same will also be needed in connection with the chemical processes generally, and for extending and rendering more complete the application of chemical tests.

The satisfaction with which pharmacists might be expected to regard the prospect of a speedy revision of the British Pharmacopœia may, however, be very considerably modified, if the reports given in the medical journals as to the arrangements that have been made for the execution of the work convey a complete account of those arrangements. It is true that the Committee makes mention of an intended application to the Pharmaceutical and Chemical Societies, as well as to the several medical authorities and such persons as may be likely to furnish useful information for making the Pharmacopœia as complete as possible; but this is a proceeding that would not travel beyond the necessities of the case so far as the Committee is concerned, and it does not seem, so far as we can gather from the published reports, to comprise any consideration for the views respecting the representation of pharmacy that have of late years been put forward and supported by forcible arguments derived from the nature of the work to be done as well from the usage of other civilized countries.

Whether the want of information on this point is due to deficiency in the reports or not, it is certainly matter for surprise that the revision of the Pharmacopœia should now appear to have been for many months under consideration by the Medical Council without any communication on the subject having been made to the Council of the Pharmaceutical Society. Is it to be inferred that some malign influence hostile to the Society dominates the proceedings of the Pharmacopœia Committee, or is that body unmindful of the necessity for recourse to practical pharmacists for assistance in the preparation of a Pharmacopœia? It would, we think, have been easy on the part of the Pharmacopœia Committee of the Medical Council to place this matter in a position satisfactory to pharmacists and calculated to ensure the attainment of the objects which that Committee has in view, by communicating to the Council of the Pharmaceutical Society the plan contemplated for the revision of the Pharmacopœia and asking the advice and support of the Society in carrying it out. Certainly, the absence of any such communication with the body which represents pharmacy bears the appearance of a slight, whether it be intentional or not, and we cannot refrain from expressing our great surprise that without such a step the arrangements for the revision of the Pharmacopœia should have been carried so far as they appear to have been. Nor is our surprise lessened by the circumstances that the Pharmacopœia Committee has entered into arrangements for engaging experts to carry out the work of revision in regard to chemistry, materia medica and practical pharmacy, and that the experts requested and willing to undertake the duty of preparing a new edition of the Pharmacopœia, without any official recognition of the Pharmaceutical body, are the Society's Professors.

NOMINATION OF LOCAL SECRETARIES.

Probably before the publication of another number of this Journal the Members and Associates in Business of the Pharmaceutical Society will be in receipt of the voting papers for the forthcoming election of Members of Council and Local Secretaries. This will, therefore, be a timely opportunity for calling attention to a form of abstention from voting which it is especially important shall not obtain to any extent this year: we refer to the omission of a large number of provincial voters to fill in the papers relating to the office of Local Secretary. The extent of this default may be estimated from the statement made last year by the Secretary, that whilst the number of towns entitled to appoint a Local Secretary was three hundred and three, nominations for the office had been received from only one hundred and ninety-two. Such a condition of affairs, if existing at certain conjunctures, might deprive the Society of one-third of its political strength. It will be seen, for instance, from the report of the proceedings of the Council on Wednesday, that it may become desirable at an early date to support the action of the Council in respect to Pharmacopœia revision by the presentation of petitions from every district, and in other ways to bring local influence to bear upon members of Parliament; but it must be evident that it will be difficult to do this effectually in places where the pharmacists have neglected to provide the most elementary means for securing prompt intercommunication and co-operation. Nor is this the only subject upon which it may become necessary for the trade to make its influence felt during the present or the next session of Parliament, and it is, therefore, to be hoped that each voter will make a point of nominating as Local Secretary the man whom he may deem most competent to serve the Society in this direction.

At the meeting of the Linnean Society last Thursday, a paper was read by Mr. John Eliot Howard bearing on some important questions in reference to the cultivation of cinchonas as a source of quinine-yielding bark. Want of space prevents our referring more at length to this paper in the present number, but we hope to have an early opportunity of giving a *résumé* of Mr. Howard's views.

* * *

On Friday, the 27th ult., the Medical Acts Amendment Bill was read a third time in the House of Lords and passed, and on Wednesday it was read a first time in the House of Commons, Mr. Mundella's name being on the back of the Bill. As a last finishing touch, before parting with the Bill, their Lordships eliminated the Apothecaries' Society of London from the list of bodies that would be entitled under its provisions to send representatives to the "Medical Board" entrusted with the carrying out of the "final examinations in England for the admission of candidates to registration as medical practitioners." The Society does not seem to have mustered a single defender, and even the Lord President admitted that its claims to representation were of the slightest. So that, as the Earl of Camperdown put it, the Society of Apothecaries will, if the Bill passes in this form, lose its power of granting licences to medical candidates, and it may, therefore be expected that its degree and diploma will not be sought after with so much avidity in the future. The Bill is set down for second reading on Thursday next.

* * *

An attempt made by the chemists and druggists' assistants of Walsall to obtain from their employers the boon involved in closing their establishments on Monday and the three following evenings in each week at eight o'clock has been fairly successful, ten out of thirteen employers having promised to conform to the rule.

* * *

We regret to have to record that on Thursday, April 26, another annuitant, Mr. William J. Froom, passed away at the age of eighty-one, the immediate cause of death being cerebral hæmorrhage. Mr. Froom was formerly in business at Exeter, and was one of the Founders of the Pharmaceutical Society. He was elected at the second election of Annuitants, in the year 1866.

* * *

Some little amusement has been caused by a paragraph that has gone the round of the press to the effect that an experiment consisting in the explosion of a thimbleful of dynamite under water, made by Mr. Allen, of Sheffield, to illustrate a lecture he was delivering in Firth College on the "Chemistry of Explosives," resulted in the destruction of the containing bucket and the scattering of the water over a portion of his audience. In an explanatory letter that appeared subsequently Mr. Allen deprecates exaggeration, and states that the explosion occurred exactly as arranged, and that the scattering of the water and the tearing open of the bucket were effects fully anticipated. It is not surprising, however, that some of the audience who did not share Mr. Allen's expectations should have come to a different conclusion and made a hasty retreat from his demonstrations.

* * *

In a paper published in the *Chemical News* (April 13, p. 169) Professor Bloxam states that removal of the nitro radicle from nitro-glycerine can be safely effected by treatment with potassium or ammonium sulphide, or the solution produced by boiling flowers of sulphur and slaked lime together in water. This last, though somewhat more slow in its action and requiring most agitation, would furnish the cheapest method of decomposing nitro-glycerine, unless it were found that the "calcium sulphide" from the tank waste of alkali works could be substituted for it. The nitro-glycerine is poured into the sulphide liquor, and after a few minutes' stirring the reduction appears to be complete, free sulphur being deposited.

* * *

The *Pharmaceutical Record* tells a strange narrative of a recent occurrence in the Insane Asylum at Staunton, Va., in which institution it is the custom to dispense the medicines for the patients in single doses in mugs. It is supposed that whilst three trays full of these mugs containing medicines were waiting for the nurses to take them into the respective wards some person tampered with the contents, for immediately after the administration of the medicines, which were supposed to be limited to iron and quinine tonics and an anodyne mixture containing fluid extract of hyoscyamus, some of the patients complained of the effects, and within ten minutes several had died, whilst two others died after two hours, and another after two days. *Post mortem* examinations disclosed the presence of aconitine, as much as four-fifths of a grain being recovered from one stomach, some of it in a crystalline condition. That the results were attributable to tincture or fluid extract of aconite is thought impossible, and, moreover, the dispensary stock of these two preparations was found undisturbed. To add to the mystery, no aconitine was known to be in the asylum, and it was not kept in stock by any chemists in the town.

* * *

It is reported to be the intention of the French Government to lay before the Legislative Assembly a Bill having for its object to increase the annual pension to M. Pasteur, voted some time since, from 12,000 to 25,000 francs, with reversion to his wife and children.

* * *

It has been decided to adopt for the new Codex, in respect to degrees Baumé, the experimental results of Messrs. Coulier, Berthelot and d'Almeida, as embodied in a report which was printed in this Journal in the year 1873 (vol. iv., p. 470).

* * *

According to the *Pharmaceutical Record* the police authorities of Washington, D.C., have issued warrants for the arrest of fourteen druggists for violation of the local Pharmacy Act, in the employment of "clerks" that were not registered pharmacists or assistants.

* * *

At a meeting of the School of Pharmacy Students' Association to be held on Thursday next, May 10, at 8 p.m., a paper on "Acetic Acid and its Derivatives" will be read by Mr. H. S. Elworthy, and a Report on Pharmacy will be made by Mr. R. A. Cripps, consisting of "Notes on the United States Pharmacopœias."

* * *

A meeting of the London Section of the Society of Chemical Industry will be held on Tuesday next, the 8th inst, when a paper on "Secondary Batteries," by Mr. C. T. Kingzett, will be read.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL.

Wednesday, May 2, 1883.

MR. MICHAEL CARTEIGHE, PRESIDENT.

MR. SAMUEL RALPH ATKINS, VICE-PRESIDENT.

Present—Messrs. Andrews, Borland, Bottle, Butt, Churchill, Gostling, Greenish, Hampson, Hills, Radley, Richardson, Robbins, Savage, Schacht, Symes, Williams, Woolley and Young.

The minutes of the previous meeting were read and confirmed.

The following, being duly registered as Pharmaceutical Chemists, were respectively granted a diploma stamped with the seal of the Society:—

Austin, Alfred.
Holmes, James Henry.
Levett, Herbert.
Marsh, Edward.
Pidgeon, Joshua David.
Ransom, Francis.
Smith, William Thomas.
Spencer, George.
Stephenson, Stephen.
Townsend, Henry Holden.
Tyson, Thomas Balmforth.
Worsley, Albert George.

ELECTIONS.

MEMBERS.

Pharmaceutical Chemists.

The following, having passed the Major examination and tendered their subscriptions for the current year, were elected "Members" of the Society:—

Burton, Walter.....Geneva.
Deeks, William Thomas .....London.
Fisher, Harry .....Bristol.
Fletcher, James Edward.....London.
Foggitt, John Blackett .....Thirsk.
Holmes, James Henry.....Kendal.
Levett, Herbert .....Bodiam.
Marsh, Edward.....Luton.
Parker, William Henry .....London.
Ransom, Francis .....London.
Shephard, William Arthur .....Gt. Malvern.
Smith, William Thomas .....Bridgnorth.
Spencer, George .....Hitchin.
Stephenson, Stephen .....Llyn y mawn.
Townsend, Henry Holden .....Bristol.
Tyson, Thomas Balmforth .....London.
Worsley, Albert George .....Folkestone.
Wright, Robert.....Buxton.
Yeatman, Frederick James.....London.

Chemist and Druggist.

The following registered chemist and druggist, who was in business on his own account before August 1, 1868, having tendered his subscription for the current year, was elected a "Member" of the Society:—

Pullan, John Richard .....Harrogate.

ASSOCIATES IN BUSINESS.

The following, having passed their respective examinations, being in business on their own account, and having tendered their subscriptions for the current year, were elected "Associates in Business" of the Society:—

Anderson, James .....Dundee.
Bates, Frederic William .....Manchester.
Baxter, William Smith .....Bradford.
Beacock, Joseph Henry .....Leeds.
Birkbeck, John Thomas .....Lincoln.
Boon, Nathaniel .....Kirton Lindsey.
Burroughs, George Henry .....Oxton.
Bush, Robert.....Norwich.
Chambers, Herbert .....Brighton.
Chapman, Walter.....London.
Clare, John .....Scarborough.
Coslett, Thomas Watts .....Brierley Hill.
Dickinson, John George .....Lancaster.
Duncalf, Thomas Henry .....Macclesfield.
Elliott, Henry .....Kimberley.
Fraser, Alexander.....Liverpool.
Harwood, George Rosamond ...Forest Hill.
Jackson, Henry Lawson .....London.
Jenkins, Evan .....New Southgate.
Jones, Charles William .....Ashby-de-la-Zouch.
Jones, Thomas Glynne .....South Stockton.
Lloyd, Walter .....Carmarthen.
McGregor, Donald .....Leith.
Michie, Charles Coutts .....London.
Morgan, William John .....Great Bridge.
Need, John .....Gt. Malvern.
Newton, George Harry .....Ashton-under-Lyne.
Phethean, James .....Bolton.
Russell, John William.....Dundee.
Saunders, Thomas Samuel .....London.
Skinner, Robert .....London.
Taylor, Henry .....Marple.
Thomas, Thomas Rees.....Burry Port.
Thorpe, Thomas Frederick .....Northampton.
Treharne, Frederick Gwilym...London.
Walker, Charles Joseph .....Ramsgate.
Walton, Frederick George .....Darlington.
Wastie, Francis .....London.
Weddle, William .....Grangetown.
Winpenny, Frank Walker .....London.
Woollings, Frank.....London.

Modified.

Cleaver, Edward Orlando .....Croydon.
Davies, Charles Edward .....Hersham.
Speight, Robert.....London.
Streater, James Hobbs .....London.
Thomas, Joseph Josiah .....Porthcawl.
Troake, Charles Francis .....Southampton.
Wrighton, Alfred .....Ilfracombe.

ASSOCIATES.

The following, having passed their respective examinations and tendered (or paid as Apprentices or Students) their subscriptions for the current year, were elected "Associates" of the Society:—

Badcock, Harry Digby .....Ottery St. Mary.
Banbury, Richard..... .....Camelford.
Barnes, James Burdon .....Knightsbridge.
Bayley, Cornelius.....Boston.
Baily, Edward .....Ramsgate.
Beckett, Harry Rumbold .....London.
Bishop, Cecil.....Brading.
Boyden, John Augustus Chas...Wisbeach.
Chattaway, William.....Leicester.
Corder, Walter Shewell .....Sunderland.
Crow, William Edward .....Louth.
Cubey, Robert .....South Shields.
Cunningham, Oscar William ...Norwich.
Dulley, David .....Wellingborough.
Dymond, Thomas Southall .....Bristol.
Elstob, John .....Richmond
Ensor, John Thomas .....Birmingham.
Foster, Henry Simpson .....Rotherham.
George, Isaac ....Gt. Yarmouth.
Gill, William.....Nottingham.
Gradidge, James Henry .....Truro.
Granger, Harold .....Nottingham.
Harrison, James Hughes.....Sheffield.
Harvey, Frederick .....Margate.
Haynes, Joseph Alfred .....Fairford.
Healy, Joseph .....Leicester.
Hill, John .....Alford.

Holwell, Alfred .....Loughborough.
Hopkins, William Richard.....Aberystwith.
Jamieson, Simpson .....St. Andrews.
Jary, Joseph James.....South Shields.
Jeans, Alfred.....Mansfield.
Jones, John Wesley.....Llanelly.
King, Arthur .....Norwich.
McNeilage, Alexander.....Greenock.
May, Samuel Augustus .....Jersey.
Midgley, Walter .....Keighley.
Painter, Frederick Hubert .....London.
Parker, Chas. Henry Mitchell...South Molton.
Phillips, Sidney .....Wolverhampton.
Presbury, Herbert Henry .....London.
Rednall, William Rush .....Northampton.
Roberts, Arthur Harry .....Barrow-in-Furness.
Rye, Frank .....Northampton.
Skyrme, Henry Edward .....Cardiff.
Slater, James Morrieson .....Loftus-in-Cleveland.
Stevens, Chas. Wm. Davis .....Upper Norwood.
Talbot, William Widdowson ...Bulwell.
Taylor, Ernest Sanderson .....Grantham.
Toplis, John Walter.....St. John's Wood.
Walker, George John .....Revesby.
Williams, William Lloyd .....Buckley.
Willoughby, Arthur John .....St. Leonards.
Wilson, Richard .....Kidderminster.

Modified.

Crosby, John.....Lincoln.
Jones, William Shepherd .....Southport.

APPRENTICES OR STUDENTS.

The following, having passed the Preliminary examination and tendered their subscriptions for the current year, were elected "Apprentices or Students" of the Society:—

Alexander, William Maxwell...Dundee.
Allez, Peter Arnold.....Guernsey.
Angel, Alfred .....Guernsey.
Bagshaw, George William .....Kenilworth.
Baker, William Herbert.....Cosham.
Baker, Willliam James .....Bradford.
Beaton, Hugh .....Woodside.
Bellamy, Francis Alan .....Streatham.
Brassington, Herbert William..Rugeley.
Breese, Charles.....London.
Bromwich, Thomas .....Dudley.
Carter, Joseph Montague .....Manchester.
Charge, Arthur William.....Chichester.
Clayton, William Hatch.....Newcastle-on-Tyne.
Coulter, Charles .....Walthamstow.
Davis, George David .....Malvern Link.
Downing, Samuel.....Braintree.
Drysdale, Robert .....Dalmeny.
Ellingworth, Alfred Thomas ...Bromsgrove.
England, Reginald Arthur .....London.
Field, Reeve Holyoake .....Birmingham.
Fitton, Robert .....Huddersfield.
Flint, Charles .....Stratford-on-Avon.
Foss, Walter Edwin .....Broadway.
Galt, Thomas James .....Thornley.
Gass, George Muncaster.....Whitehaven.
Gibbons, Alfred John .....London.
Green, Walter .....Hendon.
Hopley, David .....Goole.
Jackson, Thomas .....Altrincham.
Jones, John Lewis .....St. Asaph.
Kay, Charles William .....Leeds.
Keene, Bernard .....London.
Lane, Henry Charles George ...Salisbury.
Lewis, Thomas Wright .....Bloxwich.
McDonald, Alexander Minto.. Edinburgh.
Makepeace, Alfred Joseph .....Nuneaton.
Millbanke, William Byron.....Sunderland.
Moffat, John Archibald .....Whitehaven.
Neish, William.....Aberdeen.
Norman, Arthur Henry .....Newmarket.
Openshaw, John Wm. Walker..Lower Darwen.
Palmer, Frank Thomas .....Cheltenham.
Poole, Weston .....Newcastle, Staffs.
Tilsley, James Henry .....Berriew.
Watson, Arthur John .....Great Bridge.
Watson, David Sydney .....London.
Wells, Arthur John.....Leamington.
Wilson, John Codner .....London.
Wood, Charles Granville.....Oldham.
Yates, Charles George.....Brighton.

Several persons were restored to their former status in the Society upon payment of the current year's subscription and a fine.

RESTORATIONS TO THE REGISTER.

The following persons having severally made the required declarations and paid a fine of one guinea, their names were restored to the Register of Chemists and Druggists:—

Edwin John Frith, 50, Westminster Bridge Road, London, S.E.

Nathan Moore Green, 34, Fox Street, Liverpool.

George Francis Hart, 53, Albert Row, Southwick, Sunderland.

REPORTS OF COMMITTEES.

FINANCE.

The report of this Committee was read and adopted, and various accounts ordered to be paid. The Committee also recommended that £3000 on the General Fund be placed on deposit at the London and Westminster Bank.

The Council went into committee to consider the question of re-investment in ground rents. After considerable discussion, the Council resumed, and it was resolved that Mr. Butt's name be added to the Committee entrusted with this matter.

The Council again went into committee and discussed for some time the regulation under which fines are imposed on members who have left the Society and desired to return.

It was decided to refer the whole subject to the consideration of the Library, Laboratory and Museum Committee, to report at the next meeting of the Council.

BENEVOLENT FUND.

The report of this Committee included a recommendation of the following grants:—

£20 to the widow and the daughter of an associate and member from 1841 to 1877, to assist the applicants in emigrating, providing a certain additional sum be raised by their friends.

£10 to a former associate and member, aged 65, who has had two previous grants.

£10 to assist in the education of two orphan children of a late associate.

£10 to a registered chemist and druggist, aged 76.

The report and recommendations of the Committee were received and adopted.

LIBRARY, MUSEUM, LABORATORY, AND HOUSE.

Librarian's Report.

This report stated that the report of the Librarian had been received, and included the following particulars:—

	Attendance.	Total.	Highest.	Lowest.	Average.
March	Day	687	37	11	28
	Evening	189	17	3	10

Circulation of books.	No. of Entries. Town.	Country.	Total.
March	176	123	299

Carriage paid, £2 6*s.* 2*d.*

The undermentioned donations to the Library had been received, and the Committee recommended that the usual letter of thanks be sent to the respective donors:—

Berichte d. deutschen chemischen Gesellschaft, 188?.
Journal of the Chemical Society, 1882.
From Mr. WALTER HILLS.

Foster (M.), Text-book of physiology, 4th ed., 1883.
From the AUTHOR.

Hoffmann (F.) and F. B. Power, Manual of Chemical Analysis, as applied to the examination of medicinal chemicals, 3rd ed., 1883. From the AUTHORS.

The Committee recommended the purchase of the undermentioned works for the Library:—

Ogilvie (J.), Imperial Dictionary of the English Language, new ed., by C. Annandale.
Sprague (J. T.), Electricity, 1875.

The Committee also recommended the purchase of the undermentioned works and periodicals for the Society's Library in Edinburgh:—

Dorvault's L'Officine.
Stillé and Maisch's National Dispensatory.
United States Pharmacopœia.
British Homœopathic Pharmacopœia.
Hager's Handbuch der pharmaceutischen Praxis.
Ringer's Handbook of Therapeutics.
Quain's Dictionary of Medicine.
Sachs' Text-book of Botany.
Lindley and Moore's Treasury of Botany.
Payen's Industrial Chemistry.
Roscoe and Schorlemmer's Treatise on Chemistry.
British Medical Journal.
Lancet.
Edinburgh Medical Journal.
Nature.
Chemical News.
New Remedies.
Journal of the Chemical Society of London.
Proceedings of the Royal Society of London.

Curator's Report.

The Curator had reported that the attendance in the Museum had been:—

	Total.	Highest.	Lowest.	Average.
Morning .	483	33	11	20
Evening .	105	11	0	5

The following donations to the Museum had been received, and the Committee recommended that the usual letter of thanks be sent to the respective donors:—

A complete and valuable collection of the barks, and of Herbarium specimens of the Cinchona trees cultivated in Madras. Forwarded through HER MAJESTY'S SECRETARY OF STATE FOR INDIA.

Specimens of pure Aldehyde and Metaldehyde.
From Messrs. HOPKIN AND WILLIAMS.

Specimens of the leaves of Sethia acuminata, of Mollugo cerviana, of the resin of Semecarpus Gardneri and of the Fruits of Randia dumetorum.
From Dr. ONDAATJE, Ceylon.

Specimens of crude and refined Ozokerit; and of elastic Bitumen, from Castleton, in Derbyshire.
From Mr. L. FIELD.

Specimen of Wild Belladonna root.
From Mr. H. B. JOHNS, Southampton.

A basket of Elemi from Manilla, being an unusual form of package for the drug.
From Messrs. EVANS, LESCHER AND WEBB.

Fine pod of Bourbon Vanilla (*V. Pompona*).
From Mr. EMIL SELBERG.

Specimens of Madras and Bombay and Cochin Nux Vomica seed. From Mr. T. WHIFFEN.

Specimens of Cinchona barks not now met with in pharmacy. From Mr. E. N. BUTT.

A case of chemical specimens prepared some years ago in the Laboratory of the Society by Mr. FORD.

Professors Redwood and Bentley had attended and reported satisfactorily of their respective classes.

The President had reported the steps taken with respect to the laying down of wood pavement in Great Russell Street, he having taken the responsibility of guaranteeing that the amount required by the Board of Works in order to carry out this improvement should be forthcoming. The Committee recommended that the President's guarantee be confirmed.

The Committee had considered the alterations necessary in the regulations for written examinations consequent upon the extension of time to be introduced into the Preliminary examination, and recommended that on and after December 31, 1883, the resolution of January 7, 1874 (*Pharm. Journ.*, January 10, 1874, p. 563), be rescinded, and that the following regulations be adopted instead thereof:—

"*Regulations for Written Examinations.*

"That persons be especially appointed by the Council to superintend the written examinations; that they be called superintendents of examinations, and be paid fees for each examination; such superintendents not being necessarily members of the Board of Examiners.

"A deputy-superintendent shall be also appointed by the Council in each centre.

"A fee of one guinea for the first part and half-a-guinea for the second part of the examination shall be paid to the superintendent or deputy-superintendent on the occasion of each examination.

"The Local Secretary shall be, in the first instance, offered the appointment of superintendent.

"The Preliminary examinations shall be held in the months of January, April, July and October, on the second Tuesday of the month, from 11 a.m. to 4 p.m., with an interval of one hour from 2 to 3 p.m.

"No examinations shall take place in the house of the superintendent or deputy-superintendent. He shall be authorized to engage some apartment suitable for the purpose, and charge a sum not exceeding 15*s.* to the Society on account thereof.

"The examination for the Jacob Bell Memorial Scholarships shall be held annually on the second Tuesday in July, concurrently with the Preliminary examination.

"Notice shall be given in the *Pharmaceutical Journal* two months prior to the day of holding each Preliminary examination, that such examination will take place, and giving a list of the centres at which it will be held.

"Candidates for the Preliminary examination must pay the fee and give notice to the Registrar (on a printed form of application, to be obtained from him) of their intention to present themselves for examination, and shall also state the centre at which they desire to be examined. Such notice and the fee must in each case be in the hands of the Registrar not less than fourteen days prior to the day on which the examination is to be held.

"The examination papers shall be forwarded by the Registrar under seal, to the superintendents or deputy-superintendents, so as to be received by them not later than the morning of the day fixed for the examination. Special sheets for the candidates to write upon will also be sent by the Registrar.

"Writing materials for each candidate must be provided, and all arrangements for the accommodation of the candidates completed before the hour fixed for opening the packets of questions from the Registrar.

"The instructions to superintendents and deputy-superintendents of examinations shall be as follows:—

"*Instructions to Superintendents and Deputy-Superintendents of Examinations. To be read aloud to the Candidates before commencing their writing.*

"Candidates must be in their places at the time appointed, and after this time no candidate will be admitted.

"Candidates must be placed at a sufficient distance from each other to prevent copying, and they are not permitted to take either books, scribbling papers, or memoranda into the examination room.

"The examination papers must be opened by the superintendent or deputy-superintendent at the appointed time, in the presence of the candidates, and immediately distributed by him.

"He must see that each candidate signs his papers in the place indicated.

"The answers to the questions are to be written on one side of the paper only, the other side being intended for scribbling and calculations. No other scribbling paper is allowed to be used.

"No examination paper shall be taken from the room until the examination is complete.

"The superintendent or deputy-superintendent must carefully watch the whole examination, to see that the candidates do not use unfair means, either by assisting each other, or using books or notes. No person except the superintendent or deputy-superintendent, or a member of the Council, or of the Boards of Examiners, is permitted to be present, and on no consideration shall candidates be allowed to speak to each other after the papers are distributed.

"A candidate wishing to ask any questions must hold up his hand; the superintendent or deputy-superintendent will come to him, and satisfy any legitimate inquiry, but no explanation will be given on the subject-matter of the questions.

"At 11 a.m. the questions on Latin shall be handed to the candidates, who must deliver their written papers on that subject, with all memoranda and scribblings thereon, to the superintendent or deputy-superintendent at 12.30 p.m.

"At 12.30 p.m. the questions on Arithmetic shall be handed to the candidates, who must deliver their written papers on that subject, with all memoranda and scribblings thereon, to the superintendent or deputy-superintendent at 2 p.m.

"The superintendent or deputy-superintendent must then forthwith enclose all the written papers on Latin and Arithmetic in an envelope sent for that purpose by the Registrar, seal it with his seal, and forward it by first post thereafter to the Registrar, enclosing the accompanying declaration duly filled in and signed.

"At 3 p.m. the questions on English shall be handed to the candidates, who must deliver their written papers on that subject, with all memoranda and scribblings thereon, to the superintendent or deputy-superintendent at 4.30 p.m.

"The superintendent or deputy-superintendent must then forthwith enclose all the written papers on English in an envelope sent for that purpose by the Registrar, seal it with his seal, and forward it by first post thereafter to the Registrar, enclosing the accompanying declaration duly filled in and signed."

The resolution of the Council at its last meeting with reference to the Medical Acts Amendment Bill and Pharmacopœia revision had been considered, and it had been deemed desirable for the President to have an interview with the promoter of the Bill (the Lord President of the Council) previous to drafting any proposed amendment.

The regulations for the admission of visitors to the Museum had been considered, and it was recommended that the regulation on this subject, published in the Calendar, should be worded as follows:—"Persons not connected with the Society who are desirous of obtaining admission to the Museum, should make application to the Secretary."

An estimate had been obtained for further accommodation for specimens in the Museum, and it was recommended that an additional case be fixed in the examination room, for the reception of reference specimens, at a cost of £45.

At a second meeting of the Committee the President had reported that he had sent the following letter to the Clerk to the Privy Council. He had since had an interview with the Lord President of the Council, who was not disposed to agree to the principle of the proposed alteration of the Medical Bill.

"Pharmaceutical Society of Great Britain,
"17 Bloomsbury Square, London, W.C.
"12*th April*, 1883.

"C. Lennox Peel, Esq., C.B.

"Dear Sir,—I am requested by the Council of this Society to call the attention of the Lord President of the Council to the provisions of the 'Medical Acts Amendment Bill' in so far as they relate to the preparation and revision of the British Pharmacopœia.

"This volume is to be produced under the direction of the Medical Council, but there is no instruction as to what class of persons is to constitute the Committee which must necessarily be appointed for compiling and revising the Pharmacopœia *previous* to its publication.

"In this country, hitherto, that Committee has consisted solely of members of the medical profession, whereas in all other European countries the constitution of that Committee is fixed by law, and it includes, in every case, a considerable number of pharmaceutical chemists, and in the United States of America, pharmacists form a majority of the Committee of Revision.

"The decision as to what drugs or medicines shall be introduced into or expunged from the Pharmacopœia rests with the medical members of the Committee and the working out of the chemistry and pharmacy of the preparations and the manner in which they should be made rests with the pharmaceutical members.

"The Council of this Society considers that this or some such method should be followed in this country and laid down in the Bill now in the House of Lords. It is supported in this view by many members of the medical profession and by articles which have appeared from time to time in the medical press. Moreover, inasmuch as by the Pharmacy Act, 1868, and the Sale of Food and Drugs Acts, the Pharmacopœia is taken as the standard of purity and strength of such drugs and medicines as are contained therein, it seems desirable that the practical experience of pharmaceutical chemists should be made available on the Committee.

"I am desired by the Council to solicit the favour of a personal interview with the Lord President before the Bill is considered in Committee, to enable me to explain more fully its views and point out other considerations bearing on the subject.

"I am, dear Sir,
"Yours faithfully,
(Signed) "M. CARTEIGHE.
"*President.*"

The Committee had resolved that the President be instructed to arrange for an interview between a deputation from the Committee and those members of the House of Commons who have charge of the Bill when it arrives in that House.

The draft Annual Report had been submitted, approved and ordered to be sent to each member of the Council.

Mr. WOOLLEY asked if in future the admission of visitors to the Library and Museum would be in the discretion of the Secretary.

The PRESIDENT said the Secretary would be the person responsible.

Mr. SYMES thought it would be very satisfactory to everyone to know that any person, within reasonable limits, might gain information from the Museum and Library. He hoped the discretionary power now placed in the hands of the Secretary would be exercised in a broad and liberal spirit.

Mr. GREENISH feared that difficulties would constantly crop up in connection with this question. If it were possible—he did not know that it was—he should like to see some arrangement carried out in the Museum whereby those drawers which were really used by students qualifying for an examination should be removed to some room upstairs, all those specimens which were objects of scientific interest being left in the Museum. If this were done those visitors who came for scientific purposes would not be so liable to interfere with those who came for educational purposes.

The PRESIDENT thought the tendency of the Committee's work was in the direction indicated, and probably the difficulty would solve itself in a year or two.

Pharmacopœia Revision.

Mr. GREENISH wished to direct the attention of the Council to a very important subject which arose in connection with the Report of the General Council of Medical Education and Registration, as published in the last number of the *British Medical Journal*. It included a report from the Pharmacopœia Committee of the Medical Council which had been ordered to be received and entered on the minutes. It was in the following words:—"The Pharmacopœia Committee, at their first meeting on July 8, 1882, appointed a Sub-Committee, with power to take such steps as they thought necessary towards preparing a new edition of the Pharmacopœia and to submit a report to a future meeting of the General Committee. The Sub-Committee have reported that they have held two meetings since their appointment, and that they have communicated with Professors Redwood, Bentley and Attfield as to undertaking the duty of preparing a new edition of the Pharmacopœia under the direction of the Committee. These gentlemen have submitted to the Pharmacopœia Committee a report, which with certain modifications recommended by the Sub-Committee has been approved of and, as so amended, is appended hereto." In their report the Professors said, "Having received your instructions to proceed with the revision of the British Pharmacopœia, we now, in accordance with the suggestions made in our joint letter of November 7, enter into a more detailed explanation than we previously gave of the changes that seem to be required." He must confess it was with a feeling of great humiliation that he saw there was to be a new edition of the Pharmacopœia brought out without any official reference to the Pharmaceutical Society at all; and it was to his great astonishment that he found the three Professors of the Society had been engaged more or less in this work since November 7, six months ago. Those gentlemen held chairs endowed by the Society, and it seemed to him that they were scarcely loyal to the Society, knowing as they did that this subject had been constantly under discussion, in not giving some official intimation that they were engaged on this work. It had been said that the darkest hour of the night was nearest the dawn, and he thought one inference at any rate might be drawn, viz., that the Medical Council, by employing these gentlemen, acknowledged that it was itself incapable of undertaking the revision of the Pharmacopœia. At the same time it was humiliating to find that the Society, which had been established upwards of forty years, and had done so much for pharmaceutical education and the general advancement of pharmacy, was not directly recognized. He had no doubt that other members would feel as he did on the matter, and he hoped that the fact that their existence had been ignored on the present occasion, and that this work had been going on for six months unknown to the Council, would not prevent the Council from pressing the claim of the Society in the first place on the promoters of the Medical Acts Amendment Bill, in the shape of such an amendment as had been shadowed forth in the President's letter, and if that were not effectual, he hoped that the House of Commons would be flooded with petitions asserting the just claims of pharmacists to direct influence in the preparation of any future edition of the national Pharmacopœia.

Mr. HAMPSON said he must express the same sense of surprise which had been stated by Mr. Greenish. But though he was much grieved at the action of the Society's own professors, considering the relation which had existed between them and the Council for so many years, it must not be forgotten that there was a practical purpose to be kept in view, viz.:—to press forward the claim of pharmacists with regard to the Pharmacopœia. It might possibly be that in consequence of this appointment their cause was damaged; he was disposed to think it might be; and it was a sad thing to think that it might be damaged by the Society's own professors. Those gentlemen seemed to be interested in keeping things as they were. If they had had the interest of the Society at heart, they would no doubt have conferred with the Council on the subject, and he was sure the Council would not have desired to stand in the way of their obtaining any emolument which was offered them. He did fear that the position of the Society in respect to this question had been jeopardized from this unfortunate circumstance. Still he would rather pass over this matter and return to the more important question before the Council, how to obtain official recognition with regard to the national Pharmacopœia. He hoped the Council would strengthen the hands of the Committee and urge the necessity of leaving nothing undone, and that all legitimate and constitutional means should be employed to obtain that recognition.

Mr. WILLIAMS suggested that it would be well if the President were now to give any information he was in a position to do, as to what passed with the Lord President of the Council.

Mr. YOUNG asked if it was known to any member of the Council at the last meeting that the professors had been in communication with the Pharmacopœia Committee of the Medical Council.

Mr. BUTT thought it would facilitate matters if the President stated the results of his interview with the Lord President.

The PRESIDENT said he was quite ready to do so, but nothing was said on the occasion with regard to the appointment of the professors.

Mr. SYMES supported the view put forward by Mr. Greenish, and was very much surprised and grieved to hear of the position of affairs. Much as they all wanted a new Pharmacopœia, he was sorry to hear that a new one was being prepared under the conditions which had been explained. The assistance wanted in preparing a new Pharmacopœia was that of practical pharmacists, rather than professors of pharmacy, botany, materia medica and chemistry. Some of the greatest difficulties which occurred in pharmacopœias arose from the men who prepared them being men of theory and not of practice; a great deal might be correct in theory, which failed in practice. He was very pleased to observe in the *British Medical Journal* that all medical men did not ignore the position of pharmacists, for he noticed that Dr. George Johnson in speaking of a test for diabetic urine said he "hoped and believed that our friends and fellow workers, the pharmaceutical chemists, will prepare the standard solutions." He should support Mr. Greenish in proposing to go any reasonable length in opposing the Medical Acts Amendment Bill, unless it contained a clause which would provide for pharmacists assisting in what was their legitimate work.

Mr. SCHACHT thought it desirable that the Council should, before going further, hear anything the President had to communicate, if necessary, in committee.

The PRESIDENT said he thought there was no necessity for going into committee. The Lord President had, of course his letter before him, and also a memorial from the Council of the Pharmaceutical Society of Ireland, which had met specially to consider the subject. The Lord President listened patiently to all he had to say on the

subject, and asked him two or three questions, and then he said, the broad question was whether the Pharmacopœia as a public document was a bad book. Of course his reply was that the Society did not bring a charge against the Pharmacopœia of being a bad book, but that it might at any time become a bad book if it were not properly compiled. As a result the Lord President said he did not feel inclined to move in the question on public grounds, especially as the Bill did not make any change in this respect in the existing law. He did not wish to be weighted with too many amendments, and he did not think a sufficiently strong case had been made out to induce him to move in the question. He also asked if the editor of the Pharmacopœia was not a pharmaceutical chemist; to which, of course, he replied that though a pharmaceutical chemist he was also a professor of chemistry and pharmacy. The Lord President gave it as his opinion that in some cases the best results were obtained by employing competent men to prepare works for the body having charge of a subject. He gathered from Lord Carlingford that he rather looked upon it as a question to be dealt with between the Society and the Medical Council.

The VICE-PRESIDENT said this question had now assumed great complexity, and something more must necessarily arise from it. He understood the President did not gather that the Lord President was at all conscious of the employment of professors on the Pharmacopœia at the present time.

The PRESIDENT said he did not think the Lord President knew anything about it. He simply referred to the existing volume, and raised the question whether, if you had good special officials who submitted a report to the public body you did not get a result which was sufficiently good for the purpose. Of course he, the President, dissented from that.

Mr. YOUNG did not think the Government could be blamed for the action it had taken. The painful thing to his mind was the position in which the Society's professors stood, and he could not understand how it was the professors should have been in communication with the Pharmacopœia Committee of the Medical Council for such a long period and the Council had heard nothing about it. It appeared to him that however well fitted they were to do everything necessary in the revision of a new Pharmacopœia, they would have been very much assisted by having two or three practical pharmacists associated with them, and it would have been perfectly easy on their part to make that suggestion to those with whom they were in communication. It was a very painful thing to find that gentlemen who had been long connected with the Society should have placed themselves in such a very invidious position. At the last meeting of the Council he expressed the opinion that it was an oversight on the part of the Government that the Society had not been consulted, but he had no doubt now that the Government had been of opinion all along that the Society had been consulted, as this conference was going on with the professors. He quite agreed with Mr. Hampson that the Council should do everything to help forward this new revision and to make its influence felt.

The PRESIDENT said he had no doubt that Professor Redwood's idea was that he was a servant of the Pharmacopœia Committee. Some time ago, in a report he made to the Committee of the Medical Council, he did refer to the importance of having a committee of pharmacists. The opinion of the Council had always been that the Committee should contain practical men who were capable of knowing that any professional men appointed were competent to do their work, added to which there was a question of representation. This book became the pharmacist's law, and it seemed an anomaly in a country where representation was looked upon as a *sine quâ non* for legislation that practically those who had to obey the law were not represented on the body which made it.

The VICE-PRESIDENT suggested the Council should leave the personal question and come to the important one of what was to be done. What was wanted was direct recognition and direct representation.

Mr. GREENISH apprehended the next step would be to bring under the notice of those who might have charge of the Bill in the House of Commons, the amendment which had been suggested, and if this were not accepted, there was only one course left, namely, to do, as had been done before very efficiently, to send up petitions on the subject.

Mr. SCHACHT took the same view. He said he felt so extremely angry about the personal matter that he would rather not say anything about it. It was only within the last hour or two that he had heard of it, and he felt so much annoyed that he refrained from saying a word about the position which the Medical Council had chosen to take in the matter and the behaviour of the professors. The result showed the utter futility of attempting to employ diplomacy against professed diplomatists. The only chance of doing any good for the Society and the public was to go straight for what was thought right before the whole world, not try to creep up any back stairs, or hang on by any man's coat tails. He hoped in future the policy adopted would be a bold straighforward appeal to the authorities in a public way, letting the whole world know what they thought right, and what they wanted, and their motives for aiming at it. Then, at any rate, if they were beaten they could go again on a future occasion on the lines they had been driven from.

The PRESIDENT said there had been no attempt at diplomacy. It was the usual course to go first to the promoters of a Bill before trying to amend it. He was requested by the Committee to ask a question of the promoter of the Bill, and this he had done.

Mr. HILLS asked if anything had been done which merited the terms Mr. Schacht had used.

The PRESIDENT said he understood Mr. Schacht was speaking generally.

Mr. SCHACHT said it was desirable now to go before the House of Commons and endeavour by some such petition as the Committee would be able to draw to influence that House. The letter which the President had addressed to the Clerk of the Privy Council appeared to him to be a masterpiece of letter writing, and if a memorial to those who had charge of the measure in the House of Commons were framed on the same lines it would, in his view, be perfectly satisfactory.

Mr. HAMPSON remarked that the Committee already had full power to take all necessary steps, excepting that it had not the power, nor had the President, without the sanction of the Council, to affix the seal of the Society to any petition. He would move a resolution, therefore, conferring that power upon the President. He believed if the Council was in earnest it would succeed. The case was plain and consistent, and by no means novel, for there were precedents all over the civilized world.

The PRESIDENT then read the following resolutions, which had been passed by the Council of the Pharmaceutical Society of Ireland and forwarded to him:—

"Resolved—

"That a Memorial* be drawn up and forwarded to Lord Carlingford, the Member of the Government in charge of the Medical Bill in the House of Lords, praying that the pharmaceutical bodies in these Kingdoms shall be represented on the body to whom shall be committed the revision of the British Pharmacopœia."

"Resolved—

"That a petition be drawn up to the House of Lords, conveying the same prayer, and that it be sent to the President of the Pharmaceutical Society of Great Britain, to be entrusted by him for presentation to such member of the House as he may think best."

* The Memorial drawn up in accordance with this resolution was printed on p. 892.

Mr. ANDREWS said he had only heard the news, which had just been communicated, on Monday last, and he had never heard anything in connection with the Society which he felt more acutely. It was very painful to think that the labours of the Society for more than forty years had been entirely set aside, but it was still more painful to think that the Society's professors should have acted as they had done. He trusted, however, there would be some answer to this part of the case. If there were not he should consider their conduct most ungrateful. On that point he would say no more, but he should like to hear any explanation which the professors had to offer. The practical issue was how the Council was to go on at present, and that had been pointed out by several speakers. It must go to the promoters of the Bill, and if it could do nothing with them it must get pharmacists throughout the country to petition for their just claims.

Mr. GOSTLING suggested that it would be only proper if the Council were to ask the professors for a copy of the letter addressed to them by the Medical Council in November last.

The PRESIDENT did not think it would be dignified for the Council to raise any question with the professors on the subject. He assumed most fully, that in their communications to the Committee of the Medical Council, at some time or another, they had expressed their sense of the importance of being associated with practical pharmacists.

The report and recommendations of the Committee were then received and adopted.

It was also resolved on the motion of Mr. GREENISH—

"That the Library, Museum, Laboratory and House Committee be empowered, at its discretion, to draw up and address to the House of Commons, in the name of the Council, a petition in reference to the question of Pharmacopœia revision, and that the seal of the Society be affixed thereto."

The Council then went into committee, and considered one or two clauses of the Medical Acts Amendment Bill.

The Annual Report.

The Annual Report, as drafted by the Library, Museum, Laboratory and House Committee, was also considered by the Council in committee.

On resuming, the Report was adopted and ordered to be issued with the voting papers for the Annual Meeting.

GENERAL PURPOSES.

The report of this Committee, which was read in committee, included the usual letter from the Solicitor, stating the progress of cases which had been placed in his hands.

Two cases of alleged infringement of the Pharmacy Act had been brought before the Committee, and after consideration, it was recommended that proceedings be taken against the offenders.

The report and recommendations of the Committee were unanimously adopted.

On the motion of the PRESIDENT, seconded by the VICE-PRESIDENT, it was resolved—

"That in pursuance of a resolution of Council at its last meeting, the name of John Keith, 28, Kirkgate, Leeds, be removed from the register of members of this Society."

REPORTS OF THE GOVERNMENT VISITORS ON THE EXAMINATIONS.

The following reports from Dr. Greenhow and Dr. Maclagan, having been forwarded from the Privy Council Office for the information of the Council, were ordered to be printed in the Society's Journal:—

REPORT BY DR. GREENHOW.

[*Copy.*]

"*Report on the Examinations held by the London Board of Examiners of the Pharmaceutical Society during the year* 1882.

"During the year 1882 the London Board of Examiners of the Pharmaceutical Society held twenty-six meetings for the examination of candidates for registration under the Pharmacy Act, 1868, at twelve of which I was present on behalf of the Privy Council. This is exclusive of the first or Preliminary examination in English, Latin and Arithmetic, which is held four times in the year, and continues to be conducted by the College of Preceptors, as it has been since 1875.

"*Preliminary Examination.*—During last year 1269 candidates presented themselves for this examination, of whom 629 passed, and 640, or 50·4 per cent. failed.

"This is a smaller portion of rejections than in the previous year, when 56·6 per cent. of the candidates were rejected; but it must not therefore be too hastily assumed that there has been any material improvement in the elementary education of the candidates. Indeed, no such sudden change can be looked for, though eventually the regulation requiring this examination to be passed previous to the commencement of apprenticeship or pupilage may, perhaps, diminish the proportion of rejections, by compelling the candidates to come up for the examination immediately after leaving school.

"Whether this should prove to be the case or not the regulation cannot fail to be most beneficial to the candidates in two respects: first, when young men, on presenting themselves at the age of 16 or 17 years for this examination, find themselves unable to pass it, by reason of defective education, they will still be able, without serious loss of time, to turn themselves to some other occupation; whereas, at present when a youth fails he commonly goes on studying under very disadvantageous circumstances, during his apprenticeship, with a view to presenting himself again at a future time in the hope of eventually getting through. The second advantage I have referred to is, that having already passed this educational test before the commencement of his apprenticeship the student will be able to devote his time and thoughts exclusively to learning the strictly technical part of his business.

"The proportion of rejections to passes last year was about the average of the preceding five years, including 1881, when, as I have just said, it was very large, namely 50·9 per cent.; but the variations from year to year have been considerable, having, exclusive of the exceptional year, 1881, ranged from 42·4 per cent. in 1876, to 52·4 in 1878.

"Two changes have been made in the mode of conducting this examination, which will, I understand, come into operation this year. The examination is a written one and hitherto one hour has been allowed for each of the three subjects. Henceforward this period is to be increased to one hour and a half with an interval of one hour between the second and third subjects; and, further, the candidates are to have the option of translating a passage from the first book of Virgil's 'Aeneid,' instead of being, as heretofore, limited to one from the first book of Cæsar's 'De Bello Gallico;' these changes are favourable to the candidates and will add to the efficiency of the examination without increasing its stringency.

"Of the rejected candidates, 15 who had obtained the minimum passing number of marks allotted to each subject failed because they had not gained half the aggregate number of marks required for passing the entire examination; 80 failed in all the subjects; 303 in arithmetic; 173 in two of the three subjects; 49 in English; and 20 in Latin.

"This latter number, however, by no means represents the actual number of failures in Latin, for if those who

failed in all the subjects, or in two of them, whereof Latin was one, and those also who failed in the aggregate, be added together the rejections for Latin amount to 181 : and, even of those candidates who pass the Preliminary examination, a considerable number, amounting last year to 60, fail at the Minor examination in translating prescriptions written in Latin.

"*Major Examination.*—During last year 94 candidates were examined for the Major examination, entitling such as pass it to be registered as pharmaceutical chemists, 36 of whom passed, and 58 or 61·7 per cent. failed. This is the largest proportion of failures that has ever occurred; the next largest having been in 1880 when 54·3 per cent. were found incompetent. The large number of rejections last year cannot be ascribed either to any change in the regulations for conducting the examination or to increased strictness on the part of the examiners.

"The examination must be regarded as an examination for honours, since candidates must previously to presenting themselves for it have passed the Minor examination, which confers all the business privileges necessary for keeping an open shop for retailing, dispensing or compounding of poisons. Looked at from this aspect I do not consider the examination as set at too high a standard. It is a good practical examination and candidates who cannot pass it are certainly not entitled to hold the higher grade of pharmaceutical chemist. Of the 58 rejected candidates 19 failed upon the examination as a whole; 29 in chemistry and practical work; and 18 in botany or botany and materia medica.

"*Minor Examination.*—During last year 572 candidates offered themselves for this examination, of whom 242 passed and 330 or 57·7 per cent. failed. This again is a very large proportion of rejections, the largest excepting in 1874, when the rejections amounted to 69·3 per cent. Since that year the proportion of rejections, exclusive of 1882, has varied from year to year, and has ranged from 48·1 to 54·6 per cent. in different years.

"Of the 330 rejected candidates last year, 75 failed in the examination as a whole, that is to say, although they had gained the minimum passing number of marks in each of the several subjects, they did not obtain half the aggregate number of marks upon the whole examination. A candidate may be so weak in one subject as only to obtain the passing number of marks in it, and this may be compensated for by greater excellence in the other subjects; but, when he is so weak in all the subjects as not to gain half the aggregate number of marks on the whole examination, even though he may have attained the lowest passing number in each subject, he is clearly not fit to pass and undertake the responsibility of keeping an open shop for dispensing and compounding prescriptions. As a rule, I have observed that candidates are seldom very weak in one subject only, but, on the contrary, that when a man is weak in one branch of the examination he fails more or less completely in the other subjects.

"I may here state that the examination for each subject is conducted by a different examiner, so that a candidate who fails in the aggregate must have been found incompetent by six different examiners who are rarely aware how he has acquitted himself in the other subjects. Of the remainder 81 failed in chemistry; 39 in reading Latin prescriptions; 30 in materia medica; 24 in practical dispensing; 19 in pharmacy; 16 in botany; and 46 in two of these subjects.

"As I said in my report for 1881 the large number of rejections at this examination has occupied the serious attention of the Board of Examiners and the Council of the Pharmaceutical Society. It has also been the subject of much discussion in the pages of the *Pharmaceutical Journal*.

"Some of the speakers and writers seem to have thought that the examinations are imperfect and unsatisfactory because so many candidates are rejected, whereas on the contrary, this circumstance ought rather to indicate that the examinations are carefully conducted. It might indeed be asserted on the other hand, that the requirements from candidates are too high; but, of this no one who has not carefully observed the examinations in progress can be competent to form an opinion.

"I have now for fourteen years very closely and impartially done so, and whilst I have never hesitated to suggest improvements, or to point out deficiencies in the regulations, or in the mode of conducting the examinations, whenever I have considered it necessary, I have yet been able invariably to express a favourable opinion of the efficiency of the examinations and of the tact and good sense with which they are conducted by the Board of Examiners. I should here perhaps add that the several recommendations which I have made from time to time, more especially during the earlier years after the Pharmacy Act was passed, have been courteously received, and I believe, after due consideration, always adopted.

"Unquestionably the several changes which have been introduced in the regulations, and the mode of conducting the examinations, more especially the practical part, have raised the standard; but this was inevitable and necessary if the intention expressed in the preamble of the Pharmacy Act was to be fulfilled.

"In commencing a system of compulsory examination it would have been manifestly inequitable to have passed at once from the laxity which, previous to the enactment of the Pharmacy Act, permitted persons to carry on the trade of a chemist and druggist without any recognized qualification, and to have exercised a degree of strictness which, however desirable in itself, would have made the examinations press hardly upon a large number of candidates whose education had commenced before the Act came into operation.

"At a later period it was quite proper to make the examinations more thorough and practical and to introduce such changes as experience might have shown to be desirable.

"It is indeed much to be regretted that so many candidates should be rejected, but I am quite sure that the present examination is a sufficient test of competency in those who pass. It may, indeed, possibly happen that a rather weak candidate occasionally passes, though I cannot recollect such an instance to have fallen under my observation; but, on the other hand, I believe that no really competent candidate is ever rejected. I am als satisfied that all those who pass are qualified to carry on the business of a chemist and druggist with safety to the public, which must be regarded as the essential purpose and requirement of the Pharmacy Act.

"In my last report I mentioned that the Pharmaceutical Society had adopted a scheme of education and examination prepared by a Committee and approved by the Council of the Society, and I said that I entirely agreed with two of the recommendations: viz., first, that the Preliminary examination should be passed prior to the commencement of the period of apprenticeship or pupilage; and second, that the candidates should be required to produce evidence of apprenticeship or pupilage of not less than three years with some duly registered chemist and druggist.

"It has always appeared to me that the absence of a clause rendering an apprenticeship compulsory was an oversight in the Pharmacy Act, and my experience of the examinations from year to year has but strengthened this opinion. Pharmacy is a skilled occupation, requiring those who exercise it to possess such a practical acquaintance with drugs and manipulative skill in compounding them as can only be acquired by long and constant practice, and this skill and knowledge can in no other mode be so advantageously acquired as during an apprenticeship in a chemist's shop. Yet it was not until several years had elapsed after the enactment of the Pharmacy Act, that a regulation was adopted requiring a candidate for the Minor examination to produce a

certified declaration that he had been for three years registered and employed as an apprentice or student, or that he had been otherwise for three years practically engaged in the translation and dispensing of prescriptions. This regulation has not been found to afford a sufficient guarantee that the candidates actually have had the practical training that was intended, and the new regulation is intended to obviate this defect. An apprenticeship or pupilage, such as is now intended, should imply a certain share of responsibility on the part of the master for the pupil's progress, as well as on that of the student, and it may be hoped that henceforward the apprentice will receive a better training and have better opportunities for learning his business than seems to have hitherto been the case. I regret that, if the Society have the legal power, the period of apprenticeship has not been extended to five years. Under the new regulation a candidate who has had a fair education ought to be quite able to pass the Preliminary examination at the age of sixteen years, and the subsequent five years of his life could not be more advantageously spent than in qualifying himself by practical training in a druggist's shop for his future calling.

"When the apprenticeship is served in a small country pharmacy it might be arranged, with the concurrence of the master, that the two last years of the apprenticeship should be passed in a pharmacy in some large town, where better opportunities for learning might be found; or, the last year might, at the option of the apprentice, be occupied in attending a certain specified course of instruction in practical chemistry at a recognized school of pharmacy.

"To the fourth of the proposed regulations I can only express a qualified approval. It provides that the Minor or qualifying examination shall 'be divided into two parts, with an interval of not less than six months between the first and second portions.'

"'That the first portion be a written examination to be conducted in London, Edinburgh, and certain provincial centres, and shall consist of the translation of prescriptions from Latin into English and English into Latin, pharmacy and theoretical chemistry and botany.'

"In a further report drawn up by the same Committee and presented to the Council in March, 1883, it is proposed to omit botany from the written examination, and to extend the period between the date of passing the first portion of the examination and the second to not less than one year.

"To the proposal to divide the examination I see no objection, but I think it undesirable to hold it anywhere except in London and Edinburgh; neither do I think it desirable to insist upon an interval of not less than a year between passing the first and second portions. The candidate might, perhaps, have the choice of presenting himself for the first portion of the examination one year or six months before coming up for the second or final portion; but if in order to avoid the expense and trouble of attending twice in London or Edinburgh, he preferred passing both parts of the examination at the same time, the interval between them should not necessarily exceed a few days.

"The recommendation that the examination should be a written one is also, I think, objectionable as regards prescriptions, pharmacy and botany. The present examination in each of these subjects is thoroughly good and practical. In prescriptions the candidate is required to translate several, of different kinds, which have actually been dispensed in chemists' shops, in the presence of the examiner, who further tests the knowledge of the candidate by *vivâ voce* questions upon the doses and strength of the medicines prescribed. Next he is sent to a table by himself with a simple prescription written in English, and required to translate it into Latin, ample time being allowed him for this purpose. I consider this examination quite satisfactory as now conducted. The examiners are thoroughly competent, and whilst they do not pass incompetent candidates they allow a weak or nervous one every chance of passing if he be fit to do so. The importance of continuing this *vivâ voce* examination in translating Latin prescriptions is further shown by the fact that, notwithstanding they had all previously passed the Preliminary examination, which comprises a written examination in Latin, more than one-sixth of the candidates who were rejected at the Minor examination last year failed in reading Latin prescriptions.

"Pharmacy, as now conducted, is also a practical examination. The candidate is required to recognize the various pharmaceutical preparations of the British Pharmacopœia, submitted to him by the examiner without labels, and to describe the processes by which they are made; to explain the reasons of those processes, and to state the strength and ordinary doses of each preparation. Notwithstanding that botany is no longer recommended to be included in the written portion of the examination, I may observe that, as now conducted, the examination in it is thoroughly good and practical. It is conducted in a most efficient manner; the table in front of the examiner is covered with fresh specimens of plants upon which the candidate is required to show the various parts of the flower and the character of the leaves, stem, root, etc., the examiner putting such *vivâ voce* questions as may appear necessary in order to test the candidate's knowledge. At seasons when recent specimens of the indigenous medical plants cannot be procured, the examination is supplemented by submitting well-mounted, characteristic dried specimens to the candidate for recognition.

"I am of opinion that the proposed written examination would be an inadequate and unsatisfactory substitute for the present more practical one in each of the subjects I have mentioned; but, the case is otherwise as regards theoretical chemistry and a written examination in that subject might very beneficially be added to the present practical one, *provided* it was not allowed to stand in any respect as a substitute for it. It might be held on the same day as the examination in prescriptions, pharmacy and botany, a certain fixed time being allowed for writing the answers.

"There still remains one recommendation of the Committee to which it seems necessary that I should briefly refer. It is, that the candidate be required to produce evidence that he has, since passing the Preliminary examination, attended a course of lectures on materia medica, a course of lectures on chemistry, a course of lectures on botany, and a course of instruction in practical chemistry. This recommendation has been approved by the Council of the Pharmaceutical Society, but is not intended to come into operation until after December 31, 1887. I have already, in former reports, expressed my opinion that such a curriculum is not required for the purpose of the Pharmacy Act, and I see no reason for changing that opinion. As a matter of fact, a certain number of the candidates do not attend such lectures; and as I have already said a portion of the apprenticeship might, at the candidate's option, be passed in following such a curriculum. But whilst I would not discourage the candidates from attending the proposed course of instruction, if they pleased, I do not think it necessary to enforce such attendance. The preamble of the Pharmacy Act, 1868, states, 'that it is expedient for the safety of the public that persons keeping open shop for the retailing, dispensing, or compounding of poisons, and persons known as chemists and druggists should possess a competent practical knowledge of their business, and to that end . . . all persons not already engaged in such business, should, before commencing such business, be duly examined as to their practical knowledge.' I infer from this that no restriction beyond what is necessary for the safety of the public was intended to be imposed upon pharmacists, and I have been able, from year to year, to express my satisfaction with the results of the examination, and my opinion that, as at present conducted, it

affords a sufficient guarantee for such safety; and further, that the candidates who pass it are fit persons to be registered under the Pharmacy Act as qualified to keep open shop as chemists and druggists. I think that, so long as this is the case, no additional burden of expense or examination should be imposed upon the candidate for the Minor or qualifying examination. I conclude that the Council of the Pharmaceutical Society have been advised that they have the legal power to enforce the regulation respecting a curriculum, but I cannot help expressing a hope that, having adopted the very sound and practical regulations as to the time of passing the Preliminary examination and the stricter apprenticeship, they will defer making any further change in their regulations for candidates until these have been fairly tried and found wanting in efficiency.

"As regards the Major and voluntary examination, I have more than once said that the standard might very properly be raised, from time to time, and I think that candidates for it might be required to attend such a curriculum, as has now been proposed for the Minor examination, after passing the latter before presenting themselves for this higher qualification.

(Signed) "E. Headlam Greenhow."

[*Copy.*]

"Report by Dr. Maclagan on Pharmaceutical Examinations in Edinburgh.

"My last report embraced a period of three years; the present report does the same, extending from February, 1880, to January, 1883, inclusive.

"The results of the examinations conducted during this period will appear from the following statement:—

	Candidates.	Passed.	Failed.	Percentage of failures.
Majors . . .	29	15	14	48·2
Minors . . .	292	166	126	43·15
Modified . .	6	2	4	66·6
	327			

"The total number is smaller than in the previous triennium, when it amounted to 368; but the number of candidates, and the length of the period by which these numbers are furnished, are sufficient to enable me to remark that the proportion of failures, instead of diminishing, is actually increasing. This will appear from a perusal of the percentage of failures during these two triennia:—

	1877-80.	1880-83.
Majors	37·5	48·2
Minors	37·8	43·15
Modified	50	67

"I am, by these figures, compelled to repeat the remark made by me in my last report, that there is a great, and I may add, deplorable ignorance on the part of candidates for admission to the profession of pharmacy, as to what is required of them in the way of preparation for their examinations. It may be supposed that as some changes have taken place during these three years in the *personnel* of the examining Board in Edinburgh, this may be due to greater strictness on the part of the new examiners. On this personal matter I have only to observe that whilst the new examiners leave nothing to be regretted in regard to the changes which have taken place, they do not discharge their duties with any more stringency than was done by their predecessors, and that to my mind the decisions given as to the appearances of candidates are now, as they have always been, well balanced between justice to the public interest and fairness to the candidates. I cannot, therefore, attribute the large proportion of failures to any other cause than the want of preparedness, and the ignorance of what constitutes preparedness, on the part of candidates.

"As regards the causes of failure, I have little to say on the subject of the Majors, except to explain that the reason why 11 out of the 14 failures are due to deficiency in practical chemistry is this, that the examination on this subject is always conducted on the day before that on which the full Board of Examiners meets, and that, therefore, those who fail in the practical work do not go on to the *viva voce* examination. We see from these numbers, however, how little idea candidates have of the necessity for extending, or even for keeping up, their chemical knowledge after they have passed the Minor examination.

"The Modified candidates give no room for any remarks. Their number is small and is diminishing, and in a short while this very undesirable class of candidates will become extinct. The failures were 67 per cent., chiefly due to general insufficiency.

"The Minors are those regarding whom I have to offer a few more detailed observations, and I can, I think, make these more intelligible by adverting to the appearance of candidates in respect to the several subjects of examination.

"It is to be borne in mind that this table does not tally with the number of rejected candidates, because sometimes two of the failures refer to the same individual, and many rejections were due to general insufficiency, *i.e.*, that though the candidates got the minimum number of marks entitling them to pass in each individual subject, they did not come up to the aggregate number of marks entitling them to get their certificate. The percentages, and what I may call "black marks," got in individual subjects, and exclusive of cases of general insufficiency during the three years from 1877 to 1880, and 1880 to 1883 respectively, are as follows:—

	1877-80.	1880-83.
Botany	32·12	20·80
Chemistry	23·08	17·44
Materia Medica . . .	6·41	·671
Prescription Reading . .	1·92	5·36
Dispensing	15·38	12·08
Pharmacy	23·08	12·08

"On these various causes of failure I beg to offer a few remarks, though they must, in great measure, be repetitions of those made on former occasions.

"*Botany.*—This still stands highest among the sources of failure, and although there is considerable improvement in the average appearances, it is quite clear that the greater number of the candidates have not studied the subject in any proper sense. Most of them can name herbarium specimens of medicinal plants fairly, but they are often deficient in vegetable organography, and still more so in vegetable physiology. This last may appear to be too purely a scientific matter to be of great importance; still it is of practical value if it were only to secure that the candidate has an intelligent appreciation of the reasons why medicinal plants should be gathered at one season more than another.

"*Chemistry.*—This, as usual, takes the second place in the subjects in which failures occur. I am bound to say that there is amelioration in the average appearances of candidates as regards chemistry, but there is still much room for improvement. I have actually seen one candidate present himself to whom the examiner very properly did

not give a single mark for chemistry. He did not, for instance, know any way of distinguishing sulphate of zinc from sulphate of magnesia, except by the taste.

"With regard to these two subjects, botany and chemistry, I have to remark that the appearances of candidates, whether succeeding or failing, show how much they require a more methodical instruction than most of them have enjoyed. In my report of the previous three years I stated my opinion of the necessity for pharmaceutical students going through a regular curriculum of study. I am every year more and more impressed with the absolute necessity for this, but I do not need to insist upon this at length, because I think there is now a general consensus of opinion that a regular curriculum is necessary. Even in the case of candidates who get a sufficient number of marks to enable them to pass, the want of systematic instruction is observable. It is easy to observe, though impossible to define, the difference between a correct and an intelligent answer, between one which is the result of cram and one which is the outcome of a good instruction. But the difference can be seen better when the candidate has made a blunder. The intelligent and instructed man retrieves himself and shows that he knows more than at first sight appeared; the man who has crammed, in his struggles to correct his mistake only flounders more and more deeply into the mud. The remedy for this is true systematic instruction. It is not necessary that this should be given in London or Edinburgh, for in the case of one candidate in December, 1881, who made a most admirable appearance in chemistry, I asked the examiner after the examination was over to ascertain where this young man had been instructed, and I learned that he had had a course of chemistry by an excellent teacher in an English provincial town.

"*Materia Medica.*—The proportion of failures in this subject is comparatively small in the last three years as well as in the former three. The recognition of crude drugs is generally good, and shows that the candidates avail themselves of the museums and other collections for this purpose. Candidates are generally asked if the drugs presented to them are of good quality, but I would venture to observe that the samples shown to them are in general rather too good and typical, and that it would be well to show them also some bad samples and thus to ascertain that they can recognize those inferior or false drugs which, it is to be feared, are too common in commerce.

"*Prescription Reading.*—I was disappointed, in calculating out the averages, to find that there had been an increase of failure on this subject, because, probably accidentally, I had come upon several examples of young men whose translations of Latin prescriptions into English, and putting English prescriptions into Latin, were really very good. It is clear, however, from the average Latinity of candidates that there is room for improvement in the Preliminary examinations. It is, perhaps, not of much importance as regards practical use that a candidate should be well up in Latin quantities, provided he knows the grammar and can translate the words of a prescription, but it is desirable that some amendment should take place in this respect. It might be well if those who undertook the editing of a new Pharmacopœia would put the signs of quantity over the names of the drugs, and that we should not hear candidates who are reading prescriptions use such pronounciation as atrōpa, gentiana lutēa, conĭum, acĕtum, liquŏris. It must be said for candidates that they do not get much help in regard to Latinity from some of the things which they see in print. I have before me an advertisement from a well-known firm, in the advertising columns of the *British Medical Journal*, in which they give the designation of a special preparation, consisting of three words, two of which are hideous violations of two of the most elementary rules of Latin grammar.

"I wish here to make an observation on prescription reading in its relation to the examination in pharmacy. It is impossible in any system to avoid making one subject over-ride another to a certain extent, but this should as far as possible be avoided. In both the above-named subjects I have often observed that the very same questions as to the doses of drugs are put to the same candidate. It appears to me that these posological questions belong essentially to the examiner in pharmacy, and that in prescription reading all that need be ascertained is that the candidate shall not overlook the fact that the prescription, either through ignorance or inadvertence on the part of the prescriber, contains dangerous doses of potent drugs. It is obviously essential that the pharmacist should know the proper doses of the medicines which he dispenses. All I wish to point out is, that in examinations where the value of the candidate's replies are stated numerically, he should not, when he makes a blunder, have it counted against him twice, or that when his answers as to doses are correct he should have them twice put to his credit. It is to be distinctly understood that these remarks do not apply to the present examiner in prescription reading only, but apply equally to the examiners before his time.

"*Dispensing*: *Pharmacy.*—I take these two subjects together because the percentage of failures is the same in both, and because in the proportion of failures they come next to the two scientific subjects botany and chemistry. I have on former occasions pointed to these as showing that while there must be many creditable exceptions, there can be little doubt that, to a large extent, members of the pharmaceutical profession do not do their duty properly to their apprentices. If young men during their apprenticeship do not learn pharmacy and dispensing, it may come to be asked, and in a very practical form, what do they learn during the three years' apprenticeship the utility of which is so much insisted on? If the apprentice is merely to learn the routine duties which fall on any one standing behind a counter, six months would be enough and the three years' apprenticeship might be abolished with advantage. Pharmacists would have themselves to blame were this to come about, and would regret it if they found that instead of having apprentices to aid them in their business, they would need to secure the services of assistants, which cost money. I repeat what I have said before now, that it is an immoral thing in a pharmacist to take a young man as his apprentice and not to enable him to learn the very things which his master can teach him. Every discouragement should be given to the practice, I suspect too common, of purchasing galenical preparations, such as tinctures, from wholesale houses, instead of making the apprentice prepare them and seeing that he does so accurately. Perhaps some change in the terms of indentures, enforcing more decidedly the duty of the master to teach his apprentice practical dispensing and pharmacy, would be of use in saving time which is wasted behind the counter in retail dealing, and which might more profitably be used at a school of systematic instruction.

"As regards the final result of the examinations, I have to state my belief that the Minor examination affords ample security for the public safety at the hands of those who obtain their diplomas. I am equally bound, however, to say that the Major examination does not, to my mind, fulfil what ought to be its object,—the raising up of a class of scientific pharmacists in Britain. It is well known that it is proposed to abolish the distinction between these two examinations, and the difference between them is not so great as to lead me to make any objection to this proposal. I hope, however, that this will be done by raising the standard of the pass examination at least up to the level of the present Major, and that a strenuous attempt will be made by creating a higher class of members of the pharmaceutical profession to produce, more than at present exist, of a body of truly scientific British pharmacists.

(Signed) "DOUGLAS MACLAGAN."

The International Pharmaceutical Exhibition at Vienna.

The President said a communication had been received from the Imperial and Royal Austro-Hungarian Consul-General calling attention to the International Pharmaceutical Exhibition at Vienna, in August next, with a request that it should be brought under the notice of persons interested. It would be remembered that several notices respecting this exhibition had already appeared in the Journal, and he believed some members intended to contribute to it.

Pharmacy Acts Amendment Bill.

The President stated that communications had been received concerning the draft Bill from the Manchester Chemists and Druggists' Association, from King's Lynn, and from Mr. Vizer. These communications were referred to the Law and Parliamentary Committee.

The President also announced that the Secretary had received from Mr. Sandford the following notice of motion which he intended to bring forward at the Annual Meeting.

"That in the opinion of this meeting certain provisions set forth in the proposed Bill to regulate the sale of poisons and alter and amend the Pharmacy Acts require alteration, especially clauses 4 and 5, which render retail vendors of patent or proprietary medicines, who have not and cannot have any control over the required labelling of such medicines, liable to prosecution for insufficient labelling, for which offence the proprietors only should be and can be made responsible."

Report of Examinations.

April, 1883.

ENGLAND AND WALES.

	Candidates. Examined.	Passed.	Failed.
Major (18th)	7	1	6
„ (19th)	7	3	4
„ (25th)	5	5	0
„ (26th)	6	2	4
	— 25	—11	—14
Minor (18th)	23	9	14
„ (19th)	22	10	12
„ (20th)	26	12	14
„ (25th)	23	10	13
„ (26th)	24	8	16
„ (27th)	26	11	15
	—144	—60	—84
Modified (18th)	2	2	0
„ (19th)	2	1	1
	— 4	— 3	— 1
	173	74	99

SCOTLAND.

	Candidates. Examined.	Passed.	Failed.
Major (18th)	4	1	3
Minor (18th)	10	3	7
„ (19th)	12	7	5
„ (20th)	12	4	8
	—34	—14	—20
	38	15	23

Preliminary Examination.

Candidates. Examined.	Passed.	Failed.
366	171	195

Sixteen certificates had been received in lieu of the Society's examination:—

5 College of Preceptors.
2 Society of Apothecaries.
5 University of Cambridge.
1 „ London.
3 „ Oxford.

EXAMINATIONS IN LONDON.

April 18, 19, 20, 25, 26 *and* 27, 1883.

Present on each day—Mr. Carteighe, President; Mr. Atkins, Vice-President; Messrs. Barnes, Benger, Brady, Corder, Ekin, Fletcher, Gale, Grecnish, Linford, Plowman, Tanner, Taylor and Thresh.

Dr. Greenhow was present on the 26th, on behalf of the Privy Council.

MAJOR EXAMINATION.

18*th.*—*Seven* candidates were examined. *Six* failed. The undermentioned passed, and was declared to be duly qualified to be registered as a Pharmaceutical Chemist:—

Austin, Alfred .....Birmingham.

19*th.*—*Seven* candidates were examined. *Four* failed. The undermentioned *three* passed, and were declared to be duly qualified to be registered as Pharmaceutical Chemists:—

Levett, Herbert .....Maidstone.
Marsh, Edward..... ...Luton.
Ransom, Francis .....Hitchin.

25*th.*—*Five* candidates were examined. All passed, and were declared to be duly qualified to be registered as Pharmaceutical Chemists:—

Pidgeon, Joshua David .....Brighton.
Smith, William Thomas .....Bath.
Spencer, George .....Hitchin.
Stephenson, Stephen ... .Congleton.
Townsend, Henry Holden .....London.

26*th.*—*Six* candidates were examined. *Four* failed. The undermentioned *two* passed, and were declared to be duly qualified to be registered as Pharmaceutical Chemists:—

Tyson, Thomas Balmforth .....London.
Worsley, Albert George .....Folkestone.

MINOR EXAMINATION.

18*th.*—*Twenty-three* candidates were examined. *Fourteen* failed. The undermentioned *nine* passed, and were declared to be duly qualified to be registered as Chemists and Druggists:—

Arnott, Daniel .....Pontypridd.
Badcock, Harry Digby ..... Ottery St. Mary.
Baily, Edward ....Ramsgate.
Banbury, Richard.....Camelford.
Barnes, James Bunden .....Knightsbridge.
Beckett, Harry Rumbold .....London.
Bishop, Cecil... . .....Brading.
Carter, William .....Penzance.
Roberts, Arthur Harry .....Barrow-in-Furness.

19*th.*—*Twenty-two* candidates were examined. *Twelve* failed. The undermentioned *ten* passed, and were declared to be duly qualified to be registered as Chemists and Druggists:—

Bayley, Cornelius.....Boston.
Chattaway, William.....Leicester.
Codling, Arthur John .....Norwich.
Corder, Walter Shewell .....Sunderland.
Cubey, Robert .....South Shields.
Cullwick, Geo. Hamar Jones ...Birmingham.
Cunningham, Oscar William ...Norwich.
Curnow, William Albert .....Swansea.
Dulley, David .....Wellingborough.
Dymond, Thomas Southall.....Bristol.

20*th.*—*Twenty-six* candidates were examined. *Fourteen* failed. The undermentioned *twelve* passed, and were declared to be duly qualified to be registered as Chemists and Druggists:—

Crow, William Edward .....Louth.
Elstob, John .....Richmond.
George, Isaac ....Great Yarmouth.
Gill, William.....Nottingham.
Gradidge, James Henry .....Truro.

STATEMENT OF ATTENDANCE OF MEMBERS OF COUNCIL ON COMMITTEES FOR THE YEAR 1882-83.

	Committees held Once a Month or Oftener.		Committees held Occasionally.		Special Committees.	Total Number of Attendances.
	Finance.	Library, Museum, Laboratory, and House.	Benevolent Fund.	General Purposes.		
Number of Committee Meetings held.	12	10	12	10		
Andrews (*London*)	4	8	*	8	*	20
Atkins (*Salisbury*)	5	7	9	10	20	51
Borland (*Kilmarnock*)	*	*	*	9	*	9
Bottle (*Dover*)	*	8	8	7	11	34
Butt (*London*)	3	10	12	8	7	40
Carteighe (*London*)	2	10	11	10	28	61
Churchill (*Birmingham*)	*	*	1	4	*	5
Gostling (*Diss*)	11	6	*	9	*	26
Greenish (*London*)	*	9	6	9	13	37
Hampson (*London*)	*	6	*	8	9	23
Hills (*London*)	11	9	*	9	12	41
Radley (*Southport*)	*	*	11	10	*	21
Richardson (*Leicester*)	*	7	8	5	2	22
Robbins (*London*)	*	9	11	9	7	36
Savage (*Brighton*)	9	*	*	7	*	16
Schacht (*Clifton*)	9	0	*	10	8	27
Squire (*London*)	6	4	*	7	5	22
Symes (*Liverpool*)	4	*	*	5	8	17
Williams (*London*)	*	7	9	9	8	33
Woolley (*Manchester*)	*	*	5	5	4	14
Young (*Edinburgh*)	*	*	10	9	2	21

* Not appointed on this Committee.

NUMBER OF ATTENDANCES OF MEMBERS OF COUNCIL AT COUNCIL MEETINGS FOR THE YEAR 1882-83.

Andrews, Frederick	10	Gostling, Thomas Preston	11	Savage, William Dawson	11
Atkins, Samuel Ralph	11	Greenish, Thomas	10	Schacht, George Frederick	11
Borland, John	10	Hampson, Robert	11	Squire, Peter Wyatt	8
Bottle, Alexander	11	Hills, Walter	11	Symes, Charles	11
Butt, Edward Northway	11	Radley, William Valentine	11	Williams, John	11
Carteighe, Michael	11	Richardson, John George Fredk.	10	Woolley, George Stephen	9
Churchill, Walter John	10	Robbins, John	10	Young, James Robertson	10

Number of Meetings during the year, 11.

Granger, Harold .....Nottingham.
Guest, George Robert .....Brentwood.
Harrison, James Hughes.....Sheffield.
Haynes, Joseph Alfred .....Fairford.
Hepple, Thomas .....North Shields.
Hill, John .....Alford.
Horne, Charles .....Stourbridge.

25*th.*—*Twenty-three* candidates were examined. *Thirteen* failed. The undermentioned *ten* passed, and were declared to be duly qualified to be registered as Chemists and Druggists:—

Jeans, Alfred .....Mansfield.
Johnson, Leonard.....Aiskew.
King, Arthur.....Norwich.
Mallett, Thomas John.....Luton.
May, Samuel Augustus .....Jersey.
Micklem, Edwin .....London.
Midgley, Walter .....Keighley.
Nickolls, John Bate .....Bromsgrove.
Taylor, Ernest Sanderson .....Grantham.
Thomas, Llewelyn Lloyd .....Bala.

26*th.*—*Twenty-four* candidates were examined. *Sixteen* failed. The undermentioned *eight* passed, and were declared to be duly qualified to be registered as Chemists and Druggists:—

Low, David .....Hexham.
Painter, Frederick Hubert .....London.
Pearson, William Jackson .....Little Gowerby.
Phillips, Sidney.....Wolverhampton.
Presbury, Herbert Henry .....London.
Rawling, William John .....Devonport.
Thomas, Arthur William Wynne Bala.
Wood, Edward James.....Brentford.

27*th.*—*Twenty-six* candidates were examined. *Fifteen* failed. The undermentioned *eleven* passed, and were declared to be duly qualified to be registered as Chemists and Druggists:—

Shepherd, Robert James.....Wisbech.
Stevens, Chas. Willm. Davis...Upper Norwood.
Talbot, William Widdowson ...Bulwell.
Thwaites, Frederick.....Bishop Auckland.
Toplis, John Walter.....St. John's Wood.
Walker, George John .....Revesby.
Wallis, Edwin .....Streatham.
Williams, William Lloyd.....Buckley.
Willis, William.....Chudlington.
Willoughby, Arthur John .....St. Leonards.
Wilson, Richard .....Kidderminster.

MODIFIED EXAMINATION.

18*th.*—*Two* candidates were examined. *Both* passed, and were declared to be duly qualified to be registered as Chemists and Druggists:—

Crosby, John .....Lincoln.
Jones, William Shepherd .....Southport.

19*th.*—*Two* candidates were examined. *One* failed. The undermentioned passed, and was declared to be duly qualified to be registered as a Chemist and Druggist:—

Troake, Charles Francis .....Newbury.

PRELIMINARY EXAMINATION.

27*th.*—The undermentioned certificates were received in lieu of the Society's Examination:—

Certificates of the College of Preceptors.

Bircham, Jesse .....Reepham.
Blomfield, Thomas Nevill .....London.
Heath, Walter George.....Norwich.
Milbanke, William B. .....Sunderland.
Yates, Charles George.....Brighton.

Certificates of the Society of Apothecaries.

Scott, Sack Noy .....St. Austell.
Stocker, George .....Exeter.

Certificates of the University of Cambridge.

Dawson, Theophilus Ernest ...Gateshead.
Gibbons, Alfred John .....London.
Hobbs, William Harry .....Uxbridge.
Islip, Charles Cater .....St. Leonards.
Poole, Weston .....Newcastle, Staffs.

Certificate of the University of London.

Stacey, Wilson .....London.

Certificates of the University of Oxford.

Carter, Benjamin.....Falmouth.
Fowle, Sydney .....London.
Seaton, Richard .....Stamford.

Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

The thirteenth general meeting of the above Association was held at the Royal Institution, on Thursday, April 12, 1883, Mr. A. H. Mason, F.C.S., Vice-President, in the chair.

The minutes of the last general meeting were read and confirmed, and the following donations announced:—The *Pharmaceutical Journal*, from the Society; the 'Annual Report and Journal of the Liverpool Polytechnic Society' for 1882, from the Society.

Mr. James Crawford Bredin was elected a member, and Mr. V. T. Cole an associate.

Dr. C. Symes, alluded to one of the new tests for albumen in urine, viz., picric acid, and pointed out that strongly acid urine might give no reaction with this reagent unless a considerable excess were used.

A few remarks were made upon this subject by Messrs. R. M. Sumner, E. Davies and Conroy.

The Chairman, Mr. A. H. Mason, read and commented upon an article in the *Times*, referring to an explosion stated to have occurred on the occasion of the destruction of the dynamite prepared from the nitro-glycerine recently seized in London.

Several gentlemen, including Messrs. Conroy, Symes, Davies, A. C. Abraham and A. H. Mason, discussed the question, Mr. E. Davies explaining it by supposing that a portion of the train might have become heated, not to a sufficient extent to cause combustion at the time, but sufficient to produce such a critical molecular condition as to explode when again lighted. In proof of the probability of this explanation, Mr. Davies cited an instance in which some ½ ounce of nitro-glycerine, when being dried in his laboratory, exploded with great violence. The assistant had, in fact, in the absence of instructions, been drying the preparation on a water-bath, and having neglected it until the water had all evaporated was about to add fresh water when the air-bath, into which it had been converted, caused the explosion. Mr. Davies did not think that the temperature could have exceeded 200° to 300° C.

Mr. Mason thought that Mr. Davies' explanation did not agree with the results of Professor Abel's experiments and his opinions founded upon them.

Mr. A. C. Abraham thought that Mr. Davies' explanation would not be found to be opposed to the results arrived at by Professor Abel. He pointed out that the only difference between explosion and ordinary combustion was in the rapidity with which decomposition took place, and thought that the experiments which had been carried out by the authorities conclusively showed that the nearer the temperature of dissociation of an explosive was approached the more rapid would the combustion be, and, therefore, the more would it approach in violence to an explosion caused by a detonator.

The Honorary Treasurer then took the chair and called upon Mr. A. H. Mason, F.C.S., to read a paper on "Odours, Perfumes, and Flavours," of which the following is an abstract:—The necessity of educating the sense of

smell in our ordinary avocation was first referred to, and the action of the olfactory apparatus explained. The influence of the sense of smell, the classification of odours, the impregnation of odours, the origin and introduction of perfumery into this country, and the sources and uses of the materials derived from the animal and vegetable kingdom used in the manufacture, were fully entered into, the materials referred to being divided into ten series—animal, floral, herbal, citrine, spicey, ligneous, radical, seminal, balmy, and fruity. The various products of these materials taking the form of essential oils, ottos, pomades, essences, scented oils, alcoholic tinctures and waters. The processes actually employed for the extraction of the odorous principles from these substances were detailed—(1) by distillation with water; (2) by impregnation with fatty bodies; (3) by pressure and expression.

Mr. Mason next explained the method of procedure in the various attempts which have been made to extract these principles by more scientific and economical ways, but said these were not found of utility in actual practice. The production of artificial odorous principles by chemical artifice, such as cumarin, vanillin, and heliotropine was next explained, also the manufacture of artificial fruit essences or flavourings.

The paper was illustrated by diagrams and specimens of the various articles alluded to.

A vote of thanks was proposed by Dr. Symes, and seconded by Mr. Michael Conroy, who recommended no one to attempt to prepare artificial fruit essences from the published formulæ, as they would not thereby obtain a satisfactory product.

The discussion was continued by Messrs. E. Davies, Samuel, and the chairman, after which the vote of thanks was carried, and Mr. Mason having replied, the proceedings terminated.

NOTTINGHAM AND NOTTS CHEMISTS' ASSOCIATION.

The usual monthly meeting of the Association was held at the Masonic Hall, on Wednesday evening, April 25, the President in the chair. There was a good attendance of members and associates.

The minutes of the last meeting having been read and confirmed, the President briefly introduced Mr. H. Major, B.A., who delivered a very interesting lecture on "Beverages." He stated that a beverage, or water in some form or other, was a necessity to the human body; in fact, the body itself contained 87 per cent. of water, muscle containing 75 per cent., which was the same as blood. The functions of the body could not be carried on without water to sustain life, its greatest use being the reduction of heat in the system. There was no definite standard as to the purity of water in the ordinary sense of the word. The lecturer next dealt with milk as a beverage; this was the next in importance, and in fact contained all the elements necessary to the sustenation of the life and work of the body, and he remarked that less milk was drunk in England than in any other country of Europe, the average being only ¼ pint per head per day. After speaking of the adulteration of milk, he directed the attention of his hearers to tea and coffee as beverages, stating that the former was more preferable for general use, it having the properties of exciting vital action and perspiration, and acting directly upon the cerebral portion of the brain; coffee did not induce perspiration, but rather suppressed it, and in this respect was less valuable than tea. In conclusion, the lecturer made some remarks upon alcohol, stating that whisky was the oldest form in which it was used as a beverage, but it was with great difficulty that either it or brandy or gin was obtained pure, the latter especially being "doctored" to a very large extent. Rum was the purest form of spirit obtainable in England. He then treated upon alcohol as a food and deprecated its use, remarking that it was a narcotic, and certainly could not be proved to be of any use in the human economy.

The lecture was listened to with great interest, and at its close a vote of thanks, proposed by Mr. Beverley, and seconded by Mr. Warriner, was accorded to Mr. Major. Mr. Major having responded, the meeting terminated.

Proceedings of Scientific Societies.

BRITISH PHARMACEUTICAL CONFERENCE.

A meeting of the Executive Committee was held at 17, Bloomsbury Square, on Thursday, April 26, at 4 p.m. Present—Professor Attfield, F.R.S., etc., President, in the chair; Messrs. Brady, Carteighe, Ekin, Squire, Taylor; and Messrs. Benger and Plowman (Hon. Secretaries).

The minutes of the previous meeting were read and confirmed.

Letters of thanks for copies of the 'Year-Book of Pharmacy' were read from various societies.

A letter was read from Mr. O. R. Dawson, Secretary to the Local Committee of the last Conference meeting, expressing thanks, on behalf of the chemists of Southampton for the Bell and Hills gift of books.

In reference to a resolution passed at a previous meeting, that a circular inviting to membership be sent to all registered chemists in Great Britain and Ireland, not already connected with the Conference, it was resolved "That the mode of canvassing be adopted as on previous occasions, and that the Secretaries be instructed to carry out the details."

The question of the desirability of appointing Colonial Secretaries was discussed, and the Secretaries were instructed to obtain the names of suitable gentlemen in the colonies and India willing to undertake the duties, and submit them to a future meeting for further consideration.

The Honorary Secretaries reported that the arrangements for the Southport meeting were making satisfactory progress.

The names of a number of members whose subscriptions were in arrears were ordered to be removed from the list.

The following gentlemen were elected to membership:—Messrs. T. P. Garrett, Newport, Mon.; C. J. Holmes, London; A. C. J. Horrell, Dartford; A. E. Martin, Oldham; C. Paterson, Pollokshields; J. Righton, Southport; F. E. Rookledge, Easingwold; G. Tocher, Helensburgh; A. W. Gabriel, Queanbeyan, N.S.W.; T. M. Wilkinson, Dunedin, New Zealand.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

H. C. Dodson.—The point has not been lost sight of, as all persons passing the qualifying examination would be registered as "pharmaceutical chemists."

R. Prust.—All sales of preparations—except "patent medicines"—containing scheduled poisons are subject to the provisions of the Pharmacy Act.

G. R. Guest.—No, they are not exempt.

"*Inquirer.*"—(1) *Lychnis dioica.* (2) *Geranium molle.* Send geraniums with fruit in future. (3) *Ribes sanguinea*: not a British plant. (4) *Peltigera polydactyla* and *P. canina.* (5) *Rumex Acetosella.* (6) *Conium maculatum.*

COMMUNICATIONS, LETTERS, etc., have been received from Messrs. Baldock, Reynolds, Salmon, Hill, Greenish, Alcock, Modlen, Millhouse, Junior, W. J. W.

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LIQUOR CINCHONÆ CORDIFOLIÆ

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See PHARM. JOURN., *March* 10, 1883.

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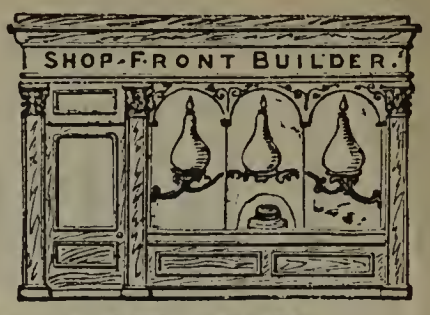

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Etc. Etc. Etc.

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Messrs. Leath & Ross, St. Paul's Church Yd., London.
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„ Thomas Hall, Lowestoft.
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Mason, W. D., Grimsby
Maston, G., Hartlepool
McCaul, J. & G., Londonderry
McRae Alexander, Edinburgh
Morris, J. L., Moss Side, Manchester
Parsonson, T., Jersey
Pattison, H., Coleham, Shrewsbury
Pittuck, F. W., Hebburn-on-Tyne
Quiray, W. D., Belfast
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Robinson, H., Guisely, Leeds
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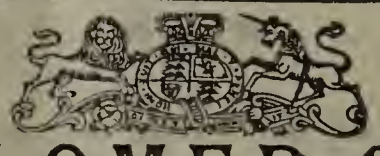

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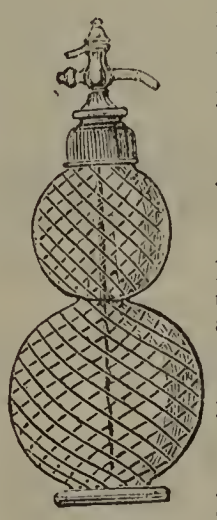

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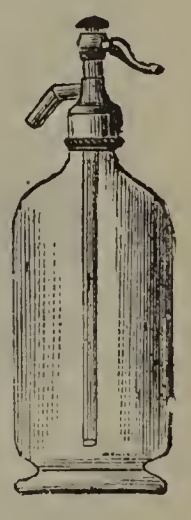

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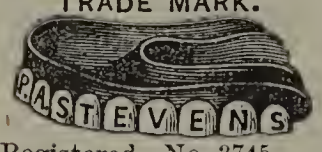

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Mr. LEVETT | Mr. STEPHENSON
Mr. TOWNSEND

MINOR.

Mr. BISHOP	Mr. PAINTER
,, CHATTAWAY	,, STEVENS
,, HARRISON	,, TAYLOR
,, GRADIDGE	,, WILLOUGHBY
,, HAYNES	,, WILSON

Candidates wishing to present themselves for the June or July examinations should at once apply for particulars to Messrs. LUFF & WOODLAND, 173, Marylebone Rd., N.W.

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Director: Dr. JOHN MUTER, M.A., F.I.C., F.C.S., &c.

FOURTEENTH SESSION, 1882-3.

A few benches remain for the 3rd B Course, which commenced April 14th. Fees, Syllabus, &c., apply to W. BAXTER, Secretary.

CONCILIO ET LABORE.

THE MANCHESTER COLLEGE OF PHARMACY.

MR. W. S. TURNER.

225, OXFORD STREET, MANCHESTER.

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Mr. M. H. CAMPION.
,, A. W. THOMAS.
,, L. L. THOMAS.

Two of these passed at the first time.

There are still a few vacancies in the classes working for the July examination, fee £7 7s., but Mr. Turner repeats that his desire is rather to be known as a thorough and conscientious teacher than as the proprietor of a big School.

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Chemistry & Pharmacy.

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SMITH, W. T.

MINOR.

BADCOCK, H. D.	HEPPLE, T.
BANBURY, R.	HILL, J.
BARLOW, G.	HORNE, C.
CARTER, W.	JEANS, A.
CORDER, W. S.	KING, A.
CURNOW, W. A.	MIDGLEY, W.
CUNNINGHAM, O. W.	MAY, S. A.
CODLING, A. J.	MALLETT, J. T.
DULLEY, D.	PEARSON, W. J.
DUNBAR, G.	RAWLINGS, W. J.
EDWARDS, R. W.	ROBERTS, A. H.
ELSTOB, JNO.	TROAKE, C. F.
GEORGE, I.	WALKER, G. J.

PRELIMINARY.

ANDREWS, E. A. | LETHEREN, E. J.
WOOD, A.

APOTHECARIES' HALL.

WILSON, D. W. R.	OWEN, D. J.
CUNNINGHAM, O. W.	BECK, P. C.
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REGISTERED ASSISTANT, in-doors, to Manage for a widow lady in the country. Close at 7 o'clock. No Sunday duty. Unexceptional references indispensable. Apply by letter, stating age, references, and salary required, to Mr. J. H. HACKETT, Ph.C., Scarboro'.

AN IMPROVER or TURNOVER in a good class country Retail and Dispensing business. Apply, stating age, reference and salary required, to WILLIAM S. BOWLER, Bridge St., Belper.

FOR the Continent.—An ASSISTANT to an old established first class business. State, by letter, age and where last engaged. Personal interview will be required. Address to Z. Z., care of Messrs. Schrader & Co., Stationers, 31, St. Mary Axe.

AN ASSISTANT, about 23 years of age. Able to Extract Teeth. For a light Retail and Dispensing business. Apply personally, or if by letter enclose carte (to be returned) and usual particulars, to B., Messrs. Flood & Co., 102 and 103, Blackman St., Borough, S.E.

WHOLESALE Drug Trade.—At once, an ASSISTANT for Goods Despatch Department. Apply, with references, salary expected, &c., to Box 159, Post Office, Newcastle-on-Tyne.

ASSISTANTS WANTED.

IMMEDIATELY.—An Improver or Turnover. Age about 18. Must be active, willing, steady, and obliging to customers. State terms, age, height, references, &c., enclosing carte if possible, to J. Holloway, Finsbury Rd., Wood Green, N.

TUNBRIDGE Wells.—A competent Assistant. About 23 years of age. Accustomed to a good-class Family and Dispensing business. With good references. Two kept. Apply to Miller & Co., 42, Mount Ephraim, Tunbridge Wells.

TRAVELLER—By a firm of Wholesale Druggists, to call on Shippers of Drugs, Chemicals, &c. None need apply unless well known to the best export buyers and able to command a good business. State particulars of previous engagements, salary required, &c., by letter to L., 12, Pemberton Rd., N.

STUDENT.—Board and lodgings, with time for study, (9 a.m. until 5 p.m.) in lieu of salary. 2d. tram fare to Wills' or Muter's schools. Must have good address, and be accustomed to good-class business. Address, Chemist, Mr. Holland, 87, Lyndhurst Rd., Peckham, London.

AN Assistant. In-door. For a light Retail and Dispensing business. Must be a neat and accurate Dispenser. Churchman preferred. Apply, stating salary required, and usual particulars, to John Saville, Pharmaceutical Chemist, Goodramgate, York.

AN Assistant. About 24. Qualified. First-class Retail and Dispensing. Usual particulars and photo. to Whitrow & Co., St. John's Rd., Tunbridge Wells.

JUNIOR. In a good seaside business. Must be able to Dispense, and have a fair knowledge of the trade. No Sunday duty. Comfortable home. Send age, height and salary required, with carte and name of reference. C. F. Smart, Chemist and Stationer, Littlehampton.

A JUNIOR Assistant. Accustomed to a good country business. Also an Improver. Apply, with references, stating age, qualification, salary required, if possible with carte, which shall be returned, Corfe, Chemist, Maidstone.

TO Parents and Guardians.—A Pharmaceutical Chemist (exam.) has a vacancy for a well educated youth as an in-door Apprentice. Comfortable home. Moderate premium required. Apply, G. G. Hornsby, 38, Lewes Rd., Brighton.

J. S. LAING, Dispensing and Family Chemist, Parkhurst Rd., Camden Rd., N., has a vacancy for an Apprentice. Business chiefly Dispensing and light Retail. Comfortable home, with time for recreation and study. An assistant kept. Moderate premium required.

QUALIFIED married Assistant, and as Manager when principal is absent. Salary commence £2 per week, with additional yearly bonus (about £30). Private part of house, unfurnished, to live in, and gas. State qualification, age, number and age of children (if any), and usual business details. References for character and ability must be first class. Abstainer preferred. Permanent situation for a competent trustworthy man. Please enclose carte to D. C. Cadman, 13, Wemyss Rd., Blackheath, S.E.

A SENIOR Assistant. In-door. Qualified. About 25 or 26. To one who has been accustomed to a good-class country business, and can be well recommended, a liberal salary will be given. Apply, with full particulars, to Dunhill & Stiles, Doncaster.

DISPENSER for a first-class Family and Dispensing business, in a fashionable inland watering place. Salary about £50, in-doors. Comfortable home. Qualification immaterial, but good address and experience are essential. Apply No. 158, Hearon, Squire & Francis, 5, Coleman St., E.C.

ASSISTANTS WANTED.

A GOOD man is required in the Laboratory of a Wholesale Druggist. Thoroughly competent to manufacture Tinctures and high class preparations. Apply, stating salary required, &c., to Chemicus, 5, Horton Rd., Hackney, E.

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JUNIOR Assistant. Apply to Keene & Ashwell, 74, New Bond St., London.

FOR China.—A thoroughly competent Assistant. Liberal terms to a suitable man. Minor qualification preferred. Apply by letter to A. S. Watson & Co., 106, Fenchurch St., E.C.

IMMEDIATELY.—A Junior Assistant, about 20, accustomed to Dispensing and light Retail. Apply, stating age, salary required, &c., Z., Evans, Gadd & Co., Exeter.

A COMPETENT Assistant, who has been accustomed to first-class Dispensing and Retail. Apply, stating age, height, with usual particulars, enclosing carte (to be returned), to George Baxter, Pharmacist, Chester.

AN Assistant. About 22 years of age. Must be well up in Dispensing and light Retail. Apply personally, or with full particulars, enclosing carte (to be returned), to W. B. Trick, 92, Green Lanes, Highbury New Park, London, N.

A SENIOR. Out-door. About 27 years of age. In a first-class Dispensing business, where two are kept. Must be a thoroughly competent Dispenser and neat writer. Apply, stating age, salary expected, and all previous engagements, to H. Thomas, Chemist, St. Leonards-on-Sea.

IMMEDIATELY.—A Manager for a widow. In-door. For a light Retail, Prescribing and Dispensing business, in one of the best suburbs in Hull. One that can Extract Teeth preferred. Age not over 30. Enclose carte, with address for references. Chemicus, 8, North Parade, Beverley Rd., Hull.

A COMPETENT Assistant. About 22. Must be a quick and accurate Dispenser. Also a vacancy for one or two well educated youths as Apprentices. Apply to W. Thomas, 103, Talbot Rd., Westbourne Grove, W.

AN Assistant. Of gentlemanly appearance and address. About 26 years of age. Who has been accustomed to first-class Dispensing business. Apply, stating age, height, reference and salary required, and enclose carte (to be returned), to Mr. Jameson, 48, Baker St., W.

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IMMEDIATELY.—Small select Retail and Dispensing Business. In centre of Clifton. No heavy trade. An immediate purchaser can have it at about value of fixtures. Owner studying for the medical profession. S. Herbert, 13, King's Rd., Clifton, Bristol.

£1200.—South Wales.—Light Retail, Prescribing and Dispensing. Well established, and in hands of vendor many years, who is retiring, and on account of continued ill-health will sell at a valuation of stock and fixtures—about £700 or £800. Shop and premises are large and convenient. Owned by vendor, who will grant lease. Fast improving town. This business is open to strict investigation. Mr. Brett, Valuer, Leicester.

LONDON.—A handsomely appointed Pharmacy. Large house, with private door. In main thoroughfare, West. Opening for a Dentist. For particulars, address, in first instance, Chemist, 8, Princes Rd., Kennington, S.E.

BUSINESSES FOR DISPOSAL.

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OLD established, sound, profitable BUSINESS. The Medical Hall, Skipton, Yorkshire. Situate in the most commanding position in the centre of the town and market-place. Established upwards of 50 years. Returns last 4 years average over £2000 a year. Skipton is both a manufacturing town and the centre of the finest and most extensive grazing district of Yorkshire, and is noted for its cattle markets and fairs. Rent of shop, &c., with extensive and commodious dwelling-house, £60 a year; warehouse, stabling, &c., £10. Present proprietor retiring. To treat apply to Mr. THOS. BROOKE, Bramhope, near Leeds; or care of HIRST, BROOKE & HIRST, Leeds.

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BUSINESSES FOR DISPOSAL.

MESSRS. GURDEN BERDOE have for transfer:—EAST COAST. High class Dispensing Trade. Returning last year £900. Yearly increasing. Good house and garden. Delightfully situated. Furniture also if desired. LINCOLNSHIRE. Old established Retail and small Wholesale. Returning £1600. Full prices. For £900. LANCS. Elegantly fitted Dispensing and Retail. Splendid house. Returning £1100. For £750. Through illness. BERKS. Delightfully situated. Retail and Dispensing Trade. Returning £600; and Mineral Waters £100, which, with capital, can be greatly increased. Everything £650, or offer. SHROPS. Family and Agricultural Trade. Same hands 18 years. Returning £500. For £200. KENT. Retail and Dispensing Trade. Improving seaside town. Returning £800. For £750. LONDON (City). Lock up, well fitted Retail. Showing £250 net profit. £500, or offer. N. Increasing suburb. Well fitted and stocked. Returning £500. Increasing. For £400. Others to suit beginners from £100. Particulars at 30, Jewry St., Aldgate, City.

GENUINE Chemist's BUSINESS. Brixton. Doing £6 to £7 per week, but capable of improvement. Good opening for Dentistry. Particulars of H. C., care of Mr. Hughes, 157, Hoxton St., N., London.

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DISPENSING and light RETAIL. Seaside town, South Coast (not Brighton). Owner retiring. Same hands 37 years. Elegantly fitted. Heavily stocked in drugs, perfumery, sundries. Full prices. Long lease. Net profits over £600. Opportunity seldom offering of acquiring first-class trade. Principals only, with £1600 cash. Apply, CHEMICUS, 59, Petherton Rd., Highbury, London.

BARGAIN.—£420. Returns £600. Rent covered. Three miles from Charing Cross. Main road. No opposition. All Dispensing and full price Retail. Shop nicely fitted and stocked. Valuable Post Office attached. Vendor must leave London next month. No agents need apply. CHEMIST, care of Bourne & Taylor, Castle St., Holborn.

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20FT., 18ft., 12ft., 7ft., 6ft., and 5ft. mahogany top Counters; 9ft. 6in. ditto, fitted with drawers; 12ft. Spanish mahogany Counter; 6ft. Spanish mahogany Counter, with elaborate Dispensing Screen on top; 11ft. mahogany Counter, with plate-glass cases in front; 9ft. ditto, ditto; 7ft. 6in. mahogany Cupboard, glass doors; a 13ft. ebonized ditto; 11ft. mahogany top Cupboard, 3ft. 6in. high, 60s. E. NATALI, 207, Old Street, near Pitfield Street, London, E.C.

A 15ft. run of Fixtures, consisting of mahogany fronted drawers, lockers under, and mahogany top, 2 plate-glass cases between shelves and drawers, mahogany fronted shelving and mahogany cornice, 10ft. 6in. high; also a 6ft. plate-glass Wall Case to match; a 12ft. Fixture, A 84; 16ft. ditto, ditto; 4ft., 6ft., 8ft., 10ft., 12ft., 14ft. nests mahogany fronted Drawers, as fig. A 79 and 80, glass knobs and gold labels, also bevelled edge gold glass labels, 8s. 6d. dozen extra; 2ft. 8in. Wall Case, with mahogany cupboard under, £6; a Wall Case, 3ft. 6in. long, very elaborate, £6 10s.; 8ft., as fig. A 87, with glass case, cupboards under, all polished mahogany, £15; a 10ft. Wall Case, £8; 9ft. 4in. ditto, ditto, £7 10s.; a Wall Case, 8ft. 3in. long, 3ft. 3in. high, 6in. deep, £7. E. NATALI, 207, Old Street, near Pitfield Street, London.

DISPENSING Screens, 5ft., 6ft., 7ft., glass case at each side, with silvered glass centre, with marble slab in front, silvered plate-glass centre, with carved wood on top, 3ft. high, the cases at each side plate-glass doors, with tablets on top, inside case fitted with silvered glass and shifting shelves, £8 10s.; as fig. A 53, 5ft. 6in. long, 8ft. long, 7ft. 6in. long; as fig. A 54, 4ft. long; as fig. A 55, 5ft. long, 6ft. long, 7ft. 6in. long; Sponge Cases, A 41, 65s.; A 43, £5; a Centre Case, 8ft. long, 5ft. wide, mahogany, £10, worth double; a number of other size Screens and Cases, very cheap. E. NATALI, 207, Old Street, near Pitfield Street, London, E.C.

PLATE-GLASS Counter Cases, as fig. A 2, 3ft. long, 4ft. long, 4ft. 6in. long; as fig. A 3, 3ft. long, 40s.; 3ft. 6in. long, 45s.; as fig. A 6, 4ft. long, 5ft. long, 6ft. long; as fig. A 7, 3ft. 6in. long, 6ft. long; as fig. A 8, 5ft. long, 6ft. long; as fig. A 13, 4ft. long, 4ft. 6in. long; fig. A 15, 6ft. 6in., 7ft., 8ft., and 9ft. long; A 16, 3ft., 3ft. 6in., 4ft. long; A 17, 4ft. and 4ft. 6in. long; A 18, 5ft., £6; 6ft., £7; 7ft. 6in., £8; 9ft., £10; Tooth Brush Cases, A 9, 35s.; A 10, to open at back, 30s.; Desk and Cases, fig. A 30, 2ft. 6in. long and 3ft. long; A 31, 65s.; Cigar Cases, A 34; Bottles, Jars, Specie Jars, Carboys, &c., &c., bargains. E. NATALI, 207, Old Street, near Pitfield Street, London, E.C.

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THE whole or part of Stocks, Fixtures, Fittings, Cases, &c., of Chemists and Druggists' Shops in Great Britain. Bottles, Pots and contents more immediately required. Estimates given for buying.

Shops completely fitted at a week's notice.

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ANYONE having surplus Fittings, Drug Drawers, Shelving, Desks, Scales, Dispensing Screen, Lamp, Drawers for under counter, &c., they wish to dispose of, may forward particulars and price to Z., 50, Union St., Torquay, Devon.

IMPORTANT TO CHEMISTS.

CIGARS.

INCREASE your incomes by selling good Cigars. The best 2d. Cigars in England, 10/- per box of 100; Escudo Reals, 15/- per 100; Fine old Regalias, 16/6 per 100; Regalia de Londres, 22/6 per 100. Send 13 stamps for samples to

A. PARTRIDGE, Importer and Manufacturer,

26, Eagle Street, City Road, LONDON. *Established* 1777.

Messrs. TAYLOR & CO.

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Licensed Valuers & Chemists' Transfer Agents,

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LONDON, E.C.

LONDON, S.W.—Good Dispensing and Prescribing BUSINESS. First-class neighbourhood. Handsome shop, well fitted and stocked. Price £200, or valuation.

NORTH OF ENGLAND.—Profitable Mixed BUSINESS. Good position in large town. Returns £1000. Price £350.

NORFOLK.—In large village. General Retail BUSINESS. Very profitable. Returns £400. Rent £18. Price £300.

DORSETSHIRE.—Dispensing and Family BUSINESS, combined with small Fancy Trade, the latter suitable for a lady to manage. Rent £37. Returns £1125. Price £1000.

CLAPHAM.—Ready money Retail and Prescribing BUSINESS. Returns £660. Rent £55, on lease. Price £550.

A REGISTER,

Containing particulars of about 250 Businesses for disposal, ranging in price from £50 to £2500, may be had on application.

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T. & Co. having been actively engaged for upwards of 20 years in the trade, vendors and purchasers consulting them have the advantage of their extensive and varied experience.

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WANTED TO PURCHASE.

PARTNERSHIP or Succession.—As ASSISTANT or MANAGER, with view to succession, in an old established business, requiring the investment of from £1000 to £1600. Or a PARTNERSHIP in a bonâ fide large concern not objected to. 13 years' London and country experience. Highest references. Capable of taking entire management. Please give full particulars, which will be treated confidentially. MANAGER, 6, Blossom St., York.

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FOR TERMS FOR ADVERTISEMENTS, SEE PAGE XXII.

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Applications for either the purchase or sale of businesses inserted in Register free of charge.

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A DENTIST is wishful to arrange with a Chemist for a visit to his establishment every Thursday on mutual terms. Town or country. By letter to DENS, 3, Stanley Ter., St. John's Hill, New Wandsworth, S.W.

A RARE BARGAIN.

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5. £500.—LONDON, N.E. ,, £500. ,, £375.
6. £650.—LONDON, S.W. ,, £650. ,, £550.
7. £800.—SCARBOROUGH. ,, £800. ,, £600.
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Other businesses, town and country, requiring £150 to £3000 investment. Full particulars on application.

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Terms for valuation on application.

Appointments for May should be made as early as possible.

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WYE HOUSE ASYLUM, Buxton, Derbyshire, for the Middle and Upper Classes of BOTH SEXES, is beautifully situated in the healthy and bracing climate of the Derbyshire Hills, and is directly accessible by the Midland and London and North Western Railways. For terms and other particulars, address the Resident Physician and Proprietor, Dr. F. K DICKSON.

Squire's (Parrish's) Chemical Food. [*Syrup. Ferri. Phosph. Comp.* (*Squire*).] P. & P. W. SQUIRE, who have for many years been the SOLE AGENTS, have purchased the right of and all particulars relating to the manufacture of PARRISH'S CHEMICAL FOOD, as prepared by the late Mr. EDWARD PARRISH, of Philadelphia.

This tonic has stood the test of time, having been more largely prescribed for the last 20 years than any other preparation of the kind. It is most peculiarly suited for delicate children, not only from its bone-forming properties and agreeable taste, but also from the fact of its containing no poisonous ingredient to interfere with its prolonged administration.

(In 4-oz., 8-oz., and 16-oz. bottles.) To distinguish this preparation orders should be written "SQUIRE'S CHEMICAL FOOD."

Confection of Fresh Bael Fruit. A valuable Remedy in Chronic Diarrhœa and Dysentery. Dose—A Teaspoonful. Prepared in this country from Bael Fruits imported ripe and fresh in their natural state.

"It possesses all the aroma of the fruit, and, when prepared with ripe fruit, is not only astringent when diarrhœa exists, but possesses the singular property of being aperient if the bowels be irregular or costive."

"Messrs. Squire's preparation is all that can be wished."—*The Lancet*, July 24, 1880. (In ½-lb. and 1-lb. Pots.)

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Euonymin. (GREEN in Colour.) Prepared from the YOUNG Bark. A powerful hepatic stimulant. Dose—2 Grains.

Tincture of Euonymin. Dose—30 Minims.

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The
Pharmaceutical Journal
AND
Transactions.

THIRD SERIES, No. 672.] SATURDAY, MAY 12, 1883. [PRICE FOURPENCE.

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Pharmaceutical Society of Great Britain,

17, BLOOMSBURY SQUARE, LONDON.

ELIAS BREMRIDGE, Secretary and Registrar.

NOTICES.

ANNUAL GENERAL MEETING.

Notice is hereby given that the forty-second Annual General Meeting of the Members and Associates in Business of the Society will be held at 17, Bloomsbury Square, Middlesex, on Wednesday, the 23rd day of May, 1883, at eleven o'clock in the forenoon for twelve *precisely*, to receive the Report of the Council, and to elect the Council and Auditors for the ensuing year.

By Order of the Council,
ELIAS BREMRIDGE, *Secretary and Registrar*,
17, Bloomsbury Square.

NOTICE of motion to be proposed at the Annual General Meeting of the Pharmaceutical Society of Great Britain, on Wednesday, May 23rd, 1883, by

GEORGE W. SANDFORD.

"That in the opinion of this meeting certain provisions set forth in the proposed Bill to regulate the Sale of Poisons and alter and amend the Pharmacy Acts require alteration, especially clauses 4 and 5, which render retail vendors of Patent or Proprietary Medicines who have not and cannot have any control over the required labelling of such medicines liable to prosecution for insufficient labelling, for which offence the proprietors only should be and can be made responsible."

CONVERSAZIONE.

By permission of the Lords of the Committee of Council on Education, the Annual Conversazione of the Pharmaceutical Society will be held at the South Kensington Museum, on the evening of Wednesday, May 23rd, at eight o'clock.

Each Associate and Apprentice of the Society, and each Chemist and Druggist on the Register, may, on application to the Secretary, obtain a card of admission for himself.

A card of admission has been sent to each Member and Associate in Business of the Society, to admit *himself and a lady.*

N.B.—No person can be admitted *without a ticket.*

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Each Scholarship is of the annual value of thirty pounds, and is to be held for one year. In addition to the Endowment, the Council provide free Laboratory instruction and admission to the lectures to the holders of the Bell Scholarships; and books of the value of five pounds, given by Mr. T. H. Hills, are divided equally between them.

The examination for these Scholarships takes place on the first Tuesday in July. Candidates desiring to compete must send notice to the Secretary, accompanied by Certificates of age and testimonials from their previous employers or Masters as to capability, industry, and general conduct, on or before the first day of June.

Further particulars can be had on applying to the Secretary, 17, Bloomsbury Square.

* A scholar is supposed to be *commencing* his studies, or at least to have made only that progress which may be reasonably looked for during an apprenticeship. The object of the examination is to ascertain that the candidate has such an amount of ability, and affords evidence of having made such use of it in the acquirement of elementary knowledge, as will justify the expectation of his proving a successful student who may do credit to the appointment, and become a useful and accomplished member of the pharmaceutical body.

Special Notice to Advertisers.—See page iii.

THE TWELFTH ANNUAL DINNER

OF THE

Members of the Pharmaceutical Society

AND THEIR FRIENDS

WILL TAKE PLACE AT WILLIS'S ROOMS, KING STREET, ST. JAMES'S

On TUESDAY, MAY 22nd, 1883, at Half-past Six o'clock.

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Chemists & Druggists' Trade Association of Great Britain.

NOTICE OF ANNUAL GENERAL MEETING.

NOTICE IS HEREBY GIVEN, that the SEVENTH ANNUAL GENERAL MEETING of the Members of this Association will be held in the Banqueting Room of the INNS OF COURT HOTEL, LINCOLN'S INN FIELDS, LONDON, W.C., on Tuesday, May 22nd, 1883, at Twelve, noon, for half-past Twelve, for the transaction of the following business :—

To receive and consider the report of the Executive Committee, and the General Statement of the Funds of the Association.

To elect an Executive Committee and Officers for the ensuing year.

To discuss questions affecting the interests of the Trade.

W. F. HAYDON, *Secretary.*

OFFICE OF THE ASSOCIATION,
23, BURLINGTON CHAMBERS, NEW STREET,
BIRMINGHAM, *May 11th*, 1883.

NOTICE TO ADVERTISERS.

THE PHARMACEUTICAL JOURNAL of MAY 26 will contain—

The Report of the Annual Meeting of the Society.
The Result of the Election to the Council.
Notices of the Annual Dinner, Conversazione, &c.
The Report of the Annual Meeting of the Chemists and Druggists' Trade Association.

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GUARANTEED PURE SOLUBLE COCOA, of the finest quality, without Sugar or admixture.

The high degree of Solubility and perfect Purity attained *is solely* due to the careful manipulation and delicate MECHANICAL treatment of the finest quality of Cocoa Beans, the *excess* of fat being extracted.

Four times the strength of Cocoas thickened, yet weakened with Starch, &c., and in reality cheaper.

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Was *introduced* to the Profession by Messrs. SAVORY & MOORE. The advantage of this (the ORIGINAL) preparation over the imitations of it consists in the ability to administer a SUFFICIENT dose of Phosphorus without the admixture of a LARGE quantity of Cod Liver Oil. Dose, 1 to 2 drachms. Supplied in bulk or small bottles.

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A Combination of the whole of the Digestive Secretions—Pepsine, Pancreatine, Diastase, or Ptyalin, &c., forming a valuable remedy in the treatment of all forms of Dyspepsia, and Diseases arising from imperfect nutrition. Dose, 3 to 5 grains.

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A Non-Saccharine Substitute for "Chemical Food."
(Dr. FREDERICK CHURCHILL, Victoria Hospital for Children.)

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The entire precipitated and bleached crystallizable alkaloids of East Indian Red Bark (*Cinchona succirubra*), containing Quinine, Cinchonidine, and Cinchonine in the form of *Muriates*. In appearance, medicinal properties, and mode of administration it closely resembles Quinine; it may be given in all cases where the pure alkaloid is required, whilst, as a tonic, and in cases where Quinine alone is objectionable, its use is especially advantageous.

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A "Scale preparation," containing 25 per cent. of Citrate of Chinoquinine. Dose and medicinal properties are same as Ferri et Quinæ Cit., P. B. In 1 oz. bottles, price 1s. 9d.

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An elegant preparation of the above in a liquid and very palatable form; prepared for convenience in Dispensing. Each fluid drachm contains 10 grains of Citrate of Iron and Chinoquinine. Price 6s. per lb.

"Pharmacist" Microscope, £4 4s. net; Materia Medica Cabinets, £2 2s. to £4 4s.; Chemical Sets (Minor), 15s; (Major), 25s.

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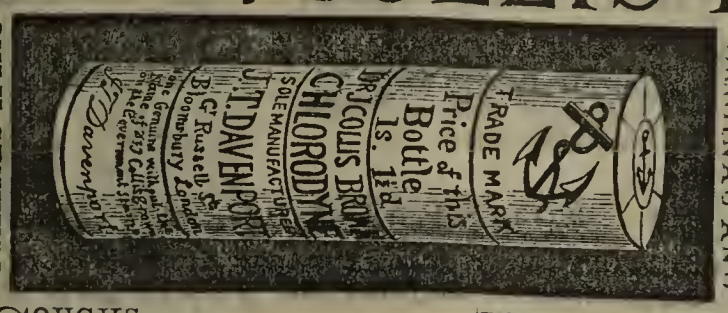

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IS THE GREAT SPECIFIC FOR CHOLERA, DIARRHŒA, DYSENTERY.

DR. J. COLLIS BROWNE'S CHLORODYNE.—Dr. J. C. BROWNE (late Army Medical Staff) DISCOVERED a REMEDY to denote which he coined the word CHLORODYNE. Dr. Browne is the SOLE INVENTOR, and, as the composition of Chlorodyne cannot possibly be discovered by Analysis (organic substances defying elimination), and since the formula has never been published, it is evident that any statement to the effect that a compound is identical with Dr. Browne's Chlorodyne *must be false.*

This Caution is necessary, as many persons deceive purchasers by false representations.

DR. J. COLLIS BROWNE'S CHLORODYNE.—Vice Chancellor Sir W. PAGE WOOD stated publicly in Court that Dr. J. COLLIS BROWNE was UNDOUBTEDLY the INVENTOR of CHLORODYNE, that the whole story of the defendant Freeman was deliberately untrue, and he regretted to say it had been sworn to.—See *The Times*, July 13th, 1864.

GENERAL BOARD of HEALTH, London, REPORT that it ACTS as a CHARM, one dose generally sufficient.

Dr. GIBBON, Army Medical Staff, Calcutta, states: "2 DOSES COMPLETELY CURED ME of DIARRHŒA."

From SYMES & Co., Pharmaceutical Chemists, Simla. *Jan.* 5, 1880.

To J. T. DAVENPORT, London.

DEAR SIR,—We congratulate you upon the widespread reputation this justly-esteemed medicine has earned for itself all over the East. As a remedy of general utility, we much question whether a better is imported, and we shall be glad to hear of its finding a place in every Anglo-Indian home. The other brands, we are happy to say, are now relegated to the native bazaars, and, judging from their sale, we fancy their sojourn there will be but evanescent. We could multiply instances *ad infinitum* of the extraordinary efficacy of DR. COLLIS BROWNE'S CHLORODYNE in Diarrhœa and Dysentery, Spasms, Cramps, Neuralgia the Vomiting of Pregnancy, and as a general sedative, that have occurred under our personal observation during many years. In Choleraic Diarrhœa, and even in the more terrible forms of Cholera itself, we have witnessed its surprisingly controlling power. We have never used any other form of this medicine than Collis Browne's, from a firm conviction that it is decidedly the best, and also from a sense of duty we owe to the profession and the public, as we are of opinion that the substitution of any other than Collis Browne's is a deliberate breach of faith on the part of the chemist to prescriber and patient alike.—We are, Sir, faithfully yours, SYMES & CO., *Members of the Pharm. Society of Great Britain, His Excellency the Viceroy's Chemists.*

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IMPORTANT CAUTION.—The IMMENSE SALE of this REMEDY has given rise to many UNSCRUPULOUS IMITATIONS. Be careful to observe Trade Mark. Of all Chemists. 1s. 1½d., 2s. 9d., and 4s. 6d.

SOLE MANUFACTURER, J. T. DAVENPORT, 33 Gt. Russell St., W.C.

IMPORTANT DECISIONS.

Lord Chancellor SELBORNE, Vice-Chancellor Sir W. PAGE WOOD, and the LORDS JUSTICES of APPEAL.

VICE-CHANCELLOR SIR W. PAGE WOOD, by whom the suit in Chancery was first heard, stated, in his judgment, that "Dr. J. Collis Browne was undoubtedly the Inventor of Chlorodyne, that the whole story of the Defendant Freeman was as deliberately untrue as the falsehood he had deposed to with reference to the use of his Chlorodyne in the Hospital."

THE VICE-CHANCELLOR also stated, "that Chlorodyne was a fanciful name, and had application been made sooner, the Court would have given Dr. Browne protection."

LORD CHANCELLOR SELBORNE coincided with the judgment of the Vice-Chancellor upon this point, and stated "that had application been made at a proper time and place, the Court would have found means to restrain the Defendant from misrepresenting the decision of the Vice-Chancellor."

LORD JUSTICE JAMES on appeal stated, in his judgment, "that the Defendant Freeman had made a deliberate misrepresentation of the decision of Vice-Chancellor Wood."

FURTHER IMPORTANT NOTICE.

The subjoined list of eminent Firms concur with Vice-Chancellor Sir W. Page Wood's statement in Court that Dr. Collis Browne was undoubtedly the Inventor of Chlorodyne; and that when Chlorodyne, or the Original Chlorodyne, is ordered, they invariably supply Dr. J. Collis Browne's:—

Apothecaries' Hall,	London.	Frazer & Green,	Glasgow.	Morson, T., & Son,	London.
Allen, Hanbury & Co.	,,	Gale & Co.	London.	Newbery & Sons,	,,
Baiss Brothers,	,,	Giles & Son,	Clifton.	Oldham, G., & Co.	Dublin.
Banks & Richards,	Birmingham.	Goulding, Messrs.	Cork.	Parsons & Richardson,	Leiecster.
Barron, Harveys & Co.	London.	Grattan & Co.	Belfast.	Peake, Allen & Co.	Dublin.
Bell, John & Co.	,,	Grimwade, Ridley,	London.	Raimes & Co.	Liverpool.
Corbyn & Co.	,,	Grindley & Son,	Chester.	Sank & Barker,	Edinburgh.
Cox & Gould,	,,	Hearon, M'Culloch & Co.	London.	Sanger, J., & Sons,	London.
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Davy, M'Murdo & Co.	,,	Hopkins & Williams,	,,	Smeeton, W.	Leeds.
Drew, Barron & Co.	,,	Johnson, J. H., & S.	Liverpool.	Southall & Co.	Birmingham.
Drew, B., & Alexander,	,,	Langton, W., & Co.	London.	Sutton, W., & Co.	London.
Dunn & Company,	,,	Lynch & Co.	,,	Tomlinson, Heyward & Co.	Lincoln.
Edwards, W.	,,	Mander, Weaver,	Wolverhampton.	Treacher, Hodgkinson & Co.	London.
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		Mackay, John,	Edinburgh.	Yates & Co.	London.

After these public statements in a Court of Equity, and subsequent confirmation by the trade at large, no Chemist can conscientiously use or sell any other compound for Chlorodyne, without committing a breach of faith, unjust to patient and physician. The *value* of the remedy *alone* creates the great demand.

Sold in Bottles—1s. 1½d., 2s. 9d., 4s. 6d., and 11s. Usual Discount to the Profession.

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Easily applied with sponge attached to the cork. Keeps its polish for a week in all kinds of weather.
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In Glass Bottles and Cartoons.

Easily applied with sponge attached to cork. Will not smear or clog, and produces a brilliant polish with little labour. Price **6d.**

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A Light Dressing for Ladies' and Children's Boots.

A Preparation which does not soil the most delicate clothing, and will not harden or crack the leather or peel off. Price **6d.** per Bottle.

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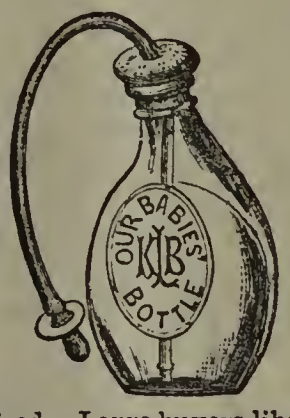

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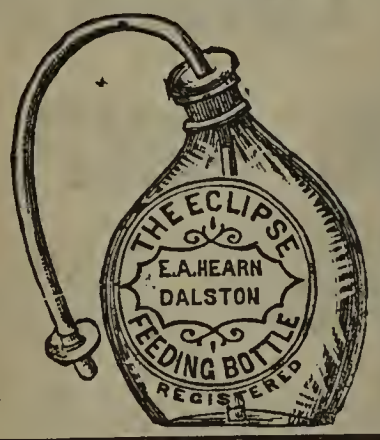
White Fittings, **30/-** per gross.
Best Black Fittings, **38/-** "



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The above will be found the BEST and CHEAPEST House in the trade.

"OUR LITTLE PETS" FEEDING BOTTLE

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British Medical Journal, April 1, 1882:—"*Wright's Liquor Carbonis Detergens*. This is by no means a new preparation; for it has been in extensive use for many years. It is an alcoholic solution of coal tar, and is disinfectant of considerable value. Medicinally, it is often used for the destruction of pediculi, and as an external application in eczema, psoriasis, and other skin diseases."

The Practitioner of September, 1881, reports a lecture entitled "Recent Advances in the Therapeutics of Diseases of the Skin," by W. A. JAMIESON, Esq, M.D., F.R.C.P. Ed. The following is an abstract therefrom:—"Itching, which owes its origin to too slow a current of blood, of which the most typical example is that seen in *Eczema* connected with varicose veins of the leg—but to the same category also many examples of Pruritus Scroti, Labiorum and Ani may be referred—is best relieved by careful flannel bandaging, well applied suspensory bandages, and laxative salts or mineral waters, which unload the rectal veins by freeing the portal circulation, combined locally with *weak tarry lotions*, one of the best of which is *Wright's Liquor Carbonis Detergens*, a well made *alcoholic solution of Coal Tar*, suitably diluted."

Proprietors: W. V. WRIGHT & CO. Southwark Street, LONDON.

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No deviation in favour of one man in a town as against another.

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Which is acknowledged on all hands to be the most reliable Preparation for removing Grease, Oil, Tar, Wax, or Paint from every description of Wearing Apparel or Household Stuffs. It neither injures the colour or texture, nor leaves any odour or stain. It is neatly got up, and is a most saleable article. Observe the word "COLLAS" on label and cap.

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Will be printed for any Chemist who gives an order for

£1 WORTH of BENZINE COLLAS,

At the following prices, viz.:—

6d. Size	...	4s. per dozen, subject to Discount.
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WELCH'S FEMALE PILLS.

These are universally acknowledged to be the Genuine, and Druggists may safely recommend them.

CAUTION!

The Proprietors of Kearsley's Original Widow Welch's Female Pills find it incumbent on them to caution the purchasers of these Pills against various imitations by parties who have no knowledge of their peculiar preparation, the Original Recipe having been sold to the late G. Kearsley, of Fleet Street, whose Widow found it necessary to make an Affidavit, for the protection of her property, in the year 1798. The Genuine Recipe for **Widow Welch's Female Pills** has been prepared by them for **96 Years!** Chemists are particularly requested to remark that, as a testimony of authenticity, each bill of directions contains an Affidavit, and bears the signature of "C. KEARSLEY," in writing, also engraved on the Government Stamp, and each box is wrapped in WHITE paper.

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APERIENT SALINE

This is a finely granulated preparation, which in dissolving produces a sustained sparkling effervescence, and a clear, bright solution. It possesses all the advantages of an agreeable saline, combined with the anti-febrile properties of Chlorate of Potash, of which it contains a considerable percentage. It is, in short, an efficient aperient and febrifuge, and makes an exceedingly pleasant and refreshing beverage.

PRICES.

THIS SALINE IS SUPPLIED IN BULK AT

1s. 6d. per pound.
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SAMPLES FREE ON APPLICATION

MANUFACTURED BY

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THE ETHER TEST OF QUININE SULPHATE.

BY A. J. COWNLEY.

It has already been shown by Dr. B. H. Paul (*Pharm. Journ.*, [3], vii., 653) that the use of ether as a means of judging of the purity of quinine sulphate cannot be relied on to give accurate results as hitherto practised, and that the ether test requires several important modifications to make it of any value for the purpose of detecting the presence of cinchonidine. The sulphate of this alkaloid being the most frequent impurity of commercial quinine sulphate and the one which is most of all likely to be met with, it is of no little importance to bear in mind that when using an undue proportion of ether, such as is prescribed in the British Pharmacopœia, the ether test will admit of quinine sulphate being passed as pure which contains nearly 30 per cent. of cinchonidine sulphate.

In the French Codex the proportion of ether to quinine sulphate prescribed for the application of this test is little more than one-half as much as is directed in the British Pharmacopœia, but it is still far too large for the detection of the presence of cinchonidine.

M. H. Byasson (*Jour. de Pharm.*, [5], vii., 291) has lately suggested a modification of the ether test for the detection of cinchonidine, quinidine and cinchonine in quinine sulphate, which consists in agitating 0·5 gram of the sample with 6 c.c. of ether and 2 c.c. of ·950 ammonia solution. On account of the proportion of ether used being less than that required by the Codex, he claims the possibility of detecting, by the separation of insoluble alkaloid, the presence of from 3 to 4 per cent. of sulphate of cinchonine, 4 to 5 per cent. of sulphate of quinidine, and from 5 to 6 per cent. of sulphate of cinchonidine.

As regards the detection of cinchonidine, however, this statement is not borne out by experiment. Applying M. Byasson's test to a mixture of pure quinine sulphate with the maximum proportion of cinchonidine sulphate said to be indicated by this test, viz., 6 per cent., it was found that no evidence of the presence of cinchonidine was given, and that even after some days' standing there was no recognizable separation of crystals of cinchonidine. Operating in the same way, with mixtures containing larger proportions of cinchonidine salt, it was found impossible by this test to detect the presence of even 20 per cent. of the admixture.

There is, indeed, no reason for being surprised at this result, since we know from the experiments described in the paper above referred to that even when using the smallest quantity of ether short of allowing the gelatinization of the alkaloid it is quite possible to fail to obtain evidence of the presence of 10 per cent. of cinchonidine by means of the ether test.

M. Byasson's results are no doubt to be attributed to the fact that the sulphate of quinine operated upon was not absolutly pure, as it is not of uncommon occurrence to meet with commercial sulphate of quinine containing up to 10 per cent. of cinchonidine sulphate (*Pharm. Journ.*, [3], vii. 672), an amount which would be passed over by the ether test.

So far as quinidine or cinchonine is concerned, the presence of salts of these alkaloids in quinine sulphate may be more easily ascertained, and the probability of their being present is so much less than that of cinchonidine sulphate that they may to a great extent be left out of consideration.

THE UNITED STATES PHARMACOPŒIA PROCESS FOR THE ESTIMATION OF HYDROCYANIC ACID.*

BY R. A. CRIPPS,

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The directions given in the United States Pharmacopœia for the estimation of hydrocyanic acid are as follows:—"13·5 grams of diluted hydrocyanic acid, diluted with 30 c.c. of water, and mixed with enough aqueous suspension of magnesia to make the mixture quite opaque, and afterwards with a few drops of solution of chromate of potassium, should require 50 c.c. of the volumetric solution of nitrate of silver, before the red colour, caused by the latter ceases to disappear on stirring (corresponding to the presence of 2 per cent. of absolute hydrocyanic acid)." On reading this I was struck by the small amount of solution of nitrate of silver required, and on calculating the amount theoretically required to precipitate the whole of the hydrocyanic acid as cyanide of silver found it to be 100 c.c. instead of 50 c.c. *Assuming* the formation of a double salt of cyanide of silver and cyanide of magnesium of the formula $MgCy_2(AgCy)_2$, and *assuming* also that chromate of silver will be precipitated as soon as the double salt is completely formed, then the figures given in the U.S. Pharmacopœia would be correct.

The object of the experiments shortly detailed in this note was to prove, first, whether or no the U.S. Pharmacopœia is correct in assuming that chromate of potassium will indicate the complete formation of double cyanide of magnesium and silver (if such exist), in the estimation of hydrocyanic acid, or whether it will only indicate the precipitation of the whole of the cyanogen as cyanide of silver; and second, whether a double cyanide of magnesium and silver really does exist, and if so, what is its composition?

To determine the first point—(1). 2·8402 grams of a sample of dilute hydrocyanic acid was estimated by the B.P. process (Dr. Senier's modification), and required 4·7 c.c. of the vol. solution of nitrate of silver, indicating nearly ·9 per cent. of absolute HCy. (2). 2·4446 grams of the same sample were then estimated by the U.S.P. method, and required 8·25 c.c., indicating 1·82 per cent. admitting the assumption before mentioned, or ·91 per cent. if (as is evident from the figures) the whole of the cyanogen is precipitated as AgCy, before any silver chromate is permanently formed, agreeing to about ·01 per cent. with the B.P. process.

The same experiment was repeated with the same result, proving conclusively that chromate of potassium will not serve as an indicator on the basis of the figures mentioned in the U.S. Pharmacopœia.

2. To prove the existence of a double cyanide of silver and magnesium, no mention being made of a double cyanide of magnesium and silver, either in Gmelin's 'Chemistry,' Watt's 'Dictionary,' or the leading English and American chemical journals, I made a few rough experiments to determine the existence of such a compound. (1). Calcined magnesia was shaken with hydrocyanic acid until alkaline to test-paper, filtered, a little chromate of potassium added, and solution of nitrate of silver run in in small quantities at a time; the precipitate at first formed was redissolved, showing that either a

* Read before the School of Pharmacy Students' Association.

double cyanide was formed or that cyanide of silver is soluble in solution of nitrate of magnesium, which latter was disproved by the addition of more nitrate of silver, when white cyanide of silver was precipitated, until the whole of the cyanogen was converted into silver cyanide, when red chromate of silver was formed. (2). Having thus proved the existence of a double salt I attempted to determine its composition by repeating the above experiment quantitatively, noting the number of c.c. of nitrate of silver solution required to give a cloudiness from the precipitation of silver cyanide, and also the number required to completely precipitate the cyanogen (indicated by the formation of red chromate of silver).

Quantity of hydrocyanic acid used .	2·5688 grams.
Quantity of st. sol. of $AgNO_3$ required to give cloudiness, from precipitation of AgCy	5·64 c.c.
Quantity of st. sol. of $AgNO_3$ required to *completely* precipitate the AgCy.	11·24 c.c.
corresponding to:—	
Real hydrocyanic acid	·030348 of a gram.
HCy required to form AgCy in double salt	·015217 of a gram.
HCy left in combination with Mg in double salt	·015131 of a gram.
Silver required to form double salt .	·0607 of a gram.

thus agreeing within the limit of experimental error with the formula $MgCy_2(AgCy)_2$.

The salt was prepared in filamentous crystals by filling an ordinary vial with hydrocyanic acid, adding excess of calcined magnesia, securely corking and heating in a water-bath for about twenty minutes, filtering and dissolving in the filtrate cyanide of silver until saturated, again filtering and evaporating over sulphuric acid.

From these experiments the following conclusions have been drawn:—

1st. That the United States Pharmacopœia is at fault in the directions given for the estimation of hydrocyanic acid, arising from a false assumption, viz.:—that chromate of potassium will indicate the complete formation of double cyanide of silver and magnesium.

2nd. That in order to use this method for the practical estimation of hydrocyanic acid, the clause "should require 50 c.c. of the volumetric solution of nitrate of silver" in the U.S.P. must be read, "should require 100 c.c. of the volumetric solution of nitrate of silver."

3rd. That the method is not so satisfactory as that in vogue in this country; for if it be carried on till the formation of red chromate of silver, double the amount of silver solution will be required, and if it be filtered before estimation, the length of time required for complete union of MgO with the HCy, and for filtration and washing, would generally exclude the method from use.

4th. That a double cyanide of magnesium and silver does exist, having the formula $MgCy_2(AgCy)_2$, analogous to that of silver and sodium NaCy,AgCy.

Since writing the above I find that the U.S. Pharmacopœia in another place states that 1 c.c. of solution of nitrate of silver is equivalent to ·0054 of a gram of HCy, which is also incorrect, being also based upon the assumption that chromate of potassium will indicate the complete formation of a double salt. The correct statement would be, that 1 c.c. of decinormal solution of nitrate of silver is equivalent to ·0027 of a gram of real HCy as shown by the following equations.

$$HCN + AgNO_3 = AgCN + HNO_3;$$

or with the addition of magnesia:—

$$2HCy + MgO = MgCy_2 + OH_2$$
$$MgCy_2 + 2AgNO_3 = 2AgCy + Mg(NO_3)_2$$

That is to say, 2·7 grams of hydrocyanic acid are equivalent to 1000 c.c. of decinormal solution of nitrate of silver, and therefore ·0027 of a gram equals 1 c.c.

ESSENTIAL OILS AND DISTILLED WATERS.

BY PERCY WELLS.

Now that the season is approaching for the distillation of essential oils and perfumed and other waters, I desire to call attention to a very simple and inexpensive plan for improving the odour and quality of oils, and preventing the decomposition of distilled waters. I have given the process a fair trial and can, therefore, speak confidently of its efficacy. The article I use is permanganate of potash, and it should be added to water before it is put into the still only in quantity enough to make it a *faint* pink.

If any chemist has rose, elder flower or orange flower waters, which are partly spoiled, let him add to them just enough of the salt to give the permanganate tinge, and then distil them, and he will find the products to have recovered their odour and not again change.

I have some waters which I treated in this way nearly two years ago, and they are perfect. I have also redistilled oils, adding to the water permanganate in the proportion of ½ to 1 grain per ounce of oil, and the result has been most satisfactory.

THE CULTIVATION OF THE POPPY IN EUROPEAN TURKEY.

The following is a translation of instructions as to the cultivation of the poppy and the method of extracting and preparing opium, which have been drawn up under the authority of the Turkish Government, and distributed throughout the agricultural districts of Macedonia, with a view to promote the development of the opium industry in that province:—

"If we take into consideration the fact that poppy seed is capable of yielding 6 okes [22½ lbs.]* of opium and 10 kilos of seed to every dunum [100 sq. metres] of land sown; that an oke of opium realizes 400 pias [£3 12*s.*], and a kilogram of poppy seed 40 pias, and therefore that altogether a dunum of land sown with poppy seed may be worth as much as 2640 pias [£23 15*s.*]; if at the same time we bear in mind that a dunum of land sown with wheat seed yields at most 10 kilos of wheat and 2000 okes of straw, and that with wheat realizing 25 pias the kilogram, and with straw being only worth 30 pias per 200 okes, the total possible value of a dunum of land sown with wheat is 280 pias [£2 10*s.*], we see at once that in comparison with wheat and other similar products the cultivation or the opium poppy is a most lucrative industry.

"Seeing then how productive of wealth the cultivation of the opium poppy has been to the agricultural population of the sandjak of Broussa the following is a short treatise supplying information on this point.

"*The Various Species of Poppy Seed and the Proper Season for Sowing.*—Poppy seed is also sometimes styled

* The figures between brackets are inserted as approximately correct.—Ed. Ph. J.

'Khashkash' seed. It is very small and it is of two kinds. One is white and the other is of a darker hue, both being contained within shells or pods, which are sometimes termed cocoons. These cocoons are globular in shape, and of the size of a Jerusalem artichoke, having on the upper side a roundish mark which is termed the 'comb.'

"The darker-hued seed is of two species. The outer shells or cocoons of the first species are small, and may be distinguished by a row of small holes, through which if great attention be not paid, as soon as the outer shells are fully matured and ready to receive the produce of the seed the latter drops and is lost. The flowers of this first species are generally of a red or purple hue. So also are the flowers of the second species, but the outer shells of the latter are larger and of an oval shape, and they have no holes in their combs.

"The white poppy seed is also of two kinds, of which though one is white the other is yellow. In other respects there is very little difference between these two kinds, both having large oval-shaped, outer shells with no holes under their combs, the flower, like the seed, being white. The opium extracted from this species of poppy is more abundant and of a superior quality to that which is the produce of the first-named species.

"Although in some localities the 'Khashkash' or poppy seed is sown, as a rule it is only utilized by yielding an oil which is extracted from it. From 100 okes (275 lbs.) of seed may be obtained a yield of 30 or 40 okes (82½ or 110 lbs.) of oil, which is of two kinds, of which one is obtained by first pounding the seed, then heating it and extracting the juice, while the seed is still hot. This oil is used in Europe in the composition of water-colour paint and oil paint, and is also burnt in lamps. It is also used in the manufacture of glass shades.

"The other kind of oil is obtained without heating the crushed seed, and having a pleasant taste is used in the preparation of food.

"Arkara-Hissar Sahib ('Afion Kara Hissar').—The seed is first heated before the oil is extracted, which is then universally used by the inhabitants in the preparation of food.

"The oil extracted from the yellow poppy seed, like the opium so extracted, is of a superior quality to the others. In localities where there is no hoar frost in spring and autumn, poppy seed is sown from the month of September up to March; but in places where there is hoar frost the seed must without fail be sown in the month of September and in the spring after the chilly weather is passed. However, seeing that in most places there is hoar frost both in spring and autumn, and that in spring, even in the month of April, there is usually some hoar frost, and that after the month of April seed time is already passed, in this country the seed should be sown in September, or at latest in the beginning of October; if the seed be sown at the season mentioned the yield both of opium and of poppy seed is more plentiful than if that operation be performed when the weather is chilly.

"*Description of the Kind of Soil most suitable to the Poppy.*—The poppy seed must be sown in light, rich, and yielding soils. If it be sown in cold clayey soil or in damp localities the yield will be small and the opium of an inferior quality.

"Ground which is to be sown with poppy seed, of whatever kind it be (*i.e.*, the seed), should be well manured, sheep's dung being of course preferable. Experience has proved that if a field which has just yielded a crop of opium be immediately sown with wheat, the crop resulting from this last sowing will be remarkably good.

"*The Method to be adopted in Sowing and the necessary subsequent Treatment.*—The soil of a field which is to be sown with poppy seed should be ploughed two or three times and well turned up. The seed should then be scattered about with the hand, just as flax seed is. After this the soil must be thoroughly stirred up and mixed by a rake or a row of bushes bound on to the back of a harrow.

"If 100 drachms (*i.e.*, Turkish drachms) of poppy seed be sown on every dunum of land, or on such an extent of land as will take a kilogram of wheat seed, it is sufficient. As soon as ever the young poppy plants begin to appear above the surface of the soil and to bear three or four leaves, in those places where they are too close together they must be taken up and planted again in such a manner as to leave a space of a span between each plant. In order to remove any weeds that may make their appearance in these spaces the soil must be hoed once or twice. This use of the hoe must never be omitted, for if there be many weeds in the field they stunt the proper and healthy growth of the plants, and cause a considerable diminution in the amount of the crop. Moreover, if the seeds of such weeds remain in the soil it becomes subsequently impossible to rid the field altogether of them.

The Course of Treatment to be observed at Harvest Time.—Opium being a substance which is extracted from the pods or outer shells described above, as soon as these pods become green in colour and have reached their full growth the green hue changes to yellow. A few days before this change of colour takes place there forms over the pods a very thin watery film of a light green hue, though somewhat indistinct in appearance. This film is called 'cougak.' If it be wiped away with the finger its place remains quite visible. If at about this time the pod be squeezed between the thumb and forefinger, it becomes so far strengthened that it cannot be easily crushed. It is then that the juice which forms the opium must be gathered.

"In order to gather the juice or paste, the first step is to take a knife made especially for this purpose, being small and as sharp-pointed as the end of a penknife, and with it to cut a semi-circular line in the pod beginning from the middle and going round the edges, at the same time leaving a space of about a finger's breadth. Immediately this is done there appears a white milk-like fluid of a bitter taste, and there forms. This fluid little by little increases in consistency, and its colour becomes darker and darker, until in twenty-four hours it becomes coffee-coloured, and as thick as paste. This is opium. This must be scraped off with the edge of a somewhat large and blunt knife and put into a poppy leaf, and so on until as much as 20 or 30 drachms of opium have been collected on one leaf, the edges of which must be turned in so as to prevent it being spilled. If, while the opium is being collected, the film above described be mixed with it, it has a beneficial effect.

"At Karahissar the work of cutting lines in the pods of the poppies is generally begun early in the afternoon and continued until nightfall. As the opium must be collected twenty-four hours after the above operation has been concluded, the following day also, soon after twelve o'clock, they begin on the one hand to collect the opium from the pods which were cut the day before, and also to cut lines in other pods, which work occupies them until the evening. But should they come across pods which are not quite ripe, they leave them alone, and five or six days afterwards they again visit them, and after cutting lines in them collect their juice.

"In order that the exact season for collecting the juice may not be missed, the whole work must be gone through and finished in five or ten days. Moreover, the proper time for marking the pods must be accurately ascertained, for if the pods be cut say ten days before or after they are quite ripe, there is no yield of opium. As an instance of this it may be mentioned that in the plain of Broussa the experiment was made. Although the plants had reached their full growth, the pods were marked or cut both before and after the exact time when the operation should have been performed, and consequently there was no yield of opium. Sometimes it happens that a dry wind begins to blow at the very time

when the poppy pods should be cut, and the atmosphere becomes chilly in consequence. During such weather the yield of opium is very small. The pods also should not be cut when it is raining, for the rain washes away and destroys the juice as fast as it exudes from the seams that have been cut for it.

"After the opium crop has been gathered in, the pods change their previous hue of either green or yellow to rose colour; when this change takes place the poppy plants should be taken up by the roots one by one and collected into small bundles. Each bundle should then be bound by a young green withe, and then so placed upright in the ground that the roots of the plants be covered, in which position they should remain for a few days until the seed contained within the pods shall have become thoroughly matured and dry. Then the pods should be threshed with a stick until they break open, when the seed may be collected.

"Another method is to sever the stem of the plant at the knot which is to be found close up to the pod, with the finger and thumb, and after collecting the ends so severed to spread them out to dry in some open place, and then to break them open by threshing, or else to pull them to pieces, and, after sifting the seed until it is quite free from extraneous matter, to collect it.

"At Karahissar they purposely burn most of the pods and reduce them to ashes, a fluid extracted from which they use to bleach cotton, on the ground that it is more effective than the water strained off from ordinary ashes.

"After extracting the oil from the poppy seed, there remains a sediment technically called 'kyusebe,' on which buffalo, cows, and black kine generally are fed, on the ground that such diet increases the amount of milk and so of 'caimak' (cream)."

THE ACTIVE CONSTITUENTS OF THE OLEANDER.*

BY O. SCHMIEDEBERG.

It is known, especially through the investigation of Pelikan, that the oleander (*Nerium Oleander*, L.) contains a cardiac poison with an action similar to that of digitalin, which the different authors who have been engaged in ascertaining its characters, — Landerer, Latour, Lacornski, Lukomski, Pelikan, Girard and Betelli,—have generally agreed in describing as a yellow resinoid body, whilst their opinions as to its chemical nature have shown a wide divergence. In the following investigation, which had for its object, among other things, to discover the chemical relations between the active constituents of the oleander and the purple foxglove, the principal materials used were oleander leaves, which were brought back in considerable quantity from Tunis, by the late Professor Gustav Williams. These were packed in bales whilst quite fresh, were scarcely withered when they arrived and were then first carefully dried.

Even with these materials the active constituents could only be isolated and their characters, but not their elementary composition, investigated. In order to establish with certainty their empirical formulæ a quantity would be required which would only be yielded in a manufacturing operation.

Oleander leaves contain two chemically different non-nitrogenous substances, both of which, however, produce the known cardiac action in a similar manner. One of these appears to be identical with digitalein, occurring in *Digitalis purpurea*; but since this identity is not yet established with the necessary certainty the substance may be provisionally called "neriin." The other active substance, which, except as to basic properties, agrees essentially with the oleandrin of Lukomski and Betelli, forms an amorphous mass very slightly soluble in water, and very easily soluble in alcohol, ether and chloroform, for which the name "olcandrin" may be adopted.

In perfectly fresh oleander leaves, gathered in German gardens in spring-time, only these two constituents could be detected. The African leaves, on the contrary, contained, besides, other substances in considerable quantity, which may have originated from the decomposition of neriin or oleandrin. One of these presented in respect to its properties a certain resemblance to digitalin, but was almost inactive. It might be named "neriantin," since upon treating it with sulphuric acid and bromine it gave very readily the beautiful colour which is peculiar to the red flowers of the oleander. Oleander leaves also contain the derivatives of neriin and oleandrin corresponding to digitaliretin.

The method adopted in the preparation of the substances mentioned was as follows. An extract was prepared with 50 per cent. alcohol from the dried and powdered leaves, and this was treated with subacetate of lead and ammonia. The precipitate first produced was lemon-yellow, and consisted of a lead compound with a substance belonging to the class of tannins, which was not further examined. Further treatment yielded a pure white precipitate which consisted of a lead compound of neriin. The neriin is not, however, completely precipitated from the liquid in this way; a portion remains in solution probably in the form of a lead compound.

Upon concentration of the yellowish filtrate from which the lead has not been removed, the neriantin separates as the alcohol evaporates in bright light flocks, which are removed by filtration of the liquid before all the alcohol has been removed, and before the separation of other dark coloured substances which would contaminate the neriantin and be afterwards difficult to remove. Subsequently, when all the alcohol has been driven off, besides fresh quantities of neriantin, oleandrin separates as a resinous mass. The filtered liquid still contains considerable quantities of oleandrin and neriin, besides the decomposition product of the latter already referred to.

1. *Neriin, or Oleander Digitalein.*

The precipitation of neriin can be effected either by means of lead subacetate in the presence of ammonia, or by tannic acid. In the presence of much free mineral acid it is also precipitated by various so-called alkaloidal precipitants, especially by solution of iodide of bismuth and potassium. This behaviour of non-nitrogenous glucosides was first utilized by Marmé in the isolation of helleborein. The most convenient method of liberating the neriin from the almost resinous tannic acid compound is to dissolve this in alcohol and then heat it to dryness on a water-bath with zinc oxide. The liberated neriin is then extracted by means of absolute alcohol, from which it is precipitated upon the addition of an excess of ether. The further purification of the crude neriin is effected by fractional precipitations of alcoholic solutions with anhydrous ether.

For the precipitation of neriin by means of an alkaloidal reagent a solution of iodide of bismuth and potassium is used most advantageously. In order to obtain a precipitate a quantity of acid—sulphuric acid is the best —must be added to the liquid. The precipitate, which quickly adheres together, is well washed upon a filter, or by decantation, with dilute sulphuric acid and decomposed in the ordinary manner with barium hydrate. The solution freed from excess of the latter by means of carbonic acid contains neriin together with barium iodide. This is removed by silver sulphate, the filtrate treated with barium hydrate to throw down excess of silver, and then after again filtering the baryta and the last traces of silver are removed by passing through the liquid first carbonic acid gas and then a few bubbles of sulphuretted hydrogen.

The colourless or faintly yellow coloured liquid contains, besides neriin, a considerable quantity of oleandrin, which upon evaporating the solution in a vacuum over

* *Archiv fur experimentelle Pathologie und Pharmakologie*, vol. xvi., p. 149.

sulphuric acid gradually separates tolerably well as a glass-clear resinous mass and is completely removed by filtration. The neriin can be then further purified in the way already mentioned by fractional precipitation. In this way perfectly colourless preparations were obtained from German oleander leaves.

Neriin, when purified as much as possible, possesses all the properties of digitalin [? digitalein]. After drying it has a faint yellowish colour, dissolves perfectly clear in water and alcohol in all proportions, is insoluble in chloroform, ether and benzin, upon boiling with concentrated hydrochloric acid communicates to the liquid a yellow, or when a less pure preparation is used, a yellowish-green colour, and gives with sulphuric acid and bromine the red colour reaction before mentioned. Its behaviour towards precipitants is the same as that of digitalein, since the latter is also precipitated by tannic acid, by subacetate of lead in the presence of ammonia and different alkaloid reagents. Slight differences in external character and in the behaviour of the two substances towards concentrated hydrochloric acid, as well as sulphuric acid and bromine, diminish with increasing purity. After complete drying over sulphuric acid it forms, when freshly prepared, a friable mass; but when preserved some time in well-closed bottles it loses this property, becomes viscous and gum-like, and no longer dissolves clear in water.

Upon carefully boiling neriin with dilute mineral acids it splits up, without any notable change of colour, into glucose and a resinous body which perfectly agrees in its reactions and external characters, as well as in respect to its physiological action, with the corresponding decomposition product from digitalein.

Although the identity of neriin with digitalein cannot be affirmed with certainty in the absence of analytical data, for which the available material was insufficient, the above facts prove beyond doubt that the two substances at least stand in very near relation to one another.

2. *Oleandrin.*

This body is obtained, as before stated, in the evaporation of the oleander extract and as a bye-product in the precipitation of neriin by alkaloidal reagents, either colourless, or more or less yellowish, or even brownish, according to the degree of purity or freedom from colour of the original solutions. For its purification oleandrin is treated with large quantities of water, which takes up about 2 or 3 parts per 1000, and this is removed from the filtered, usually colourless, aqueous solution by shaking with chloroform. Upon evaporation of the filtered chloroform solution the oleandrin is left as a transparent colourless mass, or only perceptibly yellowish coloured when in very thick layers, very easily soluble in chloroform and alcohol, but not so soluble in ether and benzin; in contact with water it gradually becomes opaque and crumbly, and after drying forms a loose white or faintly yellowish coloured, easily pulverizable substance. When solutions in alcohol and water are very slowly evaporated oleandrin separates partially in the form of thin tables of irregular contour, showing no double refraction, and presenting no crystalline structure under the microscope. After being kept some time the colourless substance assumes a lemon colour, which is not entirely removed by treatment of the alcoholic solution with charcoal. Oleandrin is also soluble in tolerably strong acetic acid. By concentrated sulphuric acid it is dissolved with a brown colour, which upon the addition of potassium bromide passes into a rather bright red.

Upon boiling oleandrin with very dilute acids a substance is formed which reduces cupric oxide in alkaline solution, and is probably glucose, and a yellow resinous body, very slightly soluble in water, but freely soluble in alcohol, chloroform and ether, which gives the bromine and sulphuric acid reaction like digitaliretin, and like it and toxiretin produces convulsions in frogs, followed by muscular paralysis. The boiling of the oleandrin must not be suspended too soon, or a portion remains unaltered and cannot be separated from the resinous decomposition product. In such cases the action of oleandrin is produced in frogs as well as the action of digitaliretin (oleandretin). Upon boiling oleandrin more strongly with concentrated mineral acids there is found again, as in the case of digitalin, a yellow or yellowish-brown inactive resinous substance, which also gives the bromine and sulphuric acid reaction. Further, upon oleandrin being kept, besides change of colour it undergoes decomposition, oleandretin being formed and, apparently, neriantin. The relations of the latter to the mother substance can not, however, be stated.

Oleandrin possesses all the physiological properties characteristic of the group of digitalin poisons. To produce systolic pause in the heart of a frog the average dose required is 0·25 milligram.

3. *Neriantin.*

The crude neriantin obtained by the process described is most suitably purified by dissolving it in a little warm alcohol containing water, treating this solution with so much ether that a thin layer of aqueous liquid is separated at the bottom of the vessel, and removing from this the alcohol-ether solution by decantation. Upon treatment of the latter with a larger quantity of ether and a proportional quantity of water, so that a layer of aqueous liquid is again formed at the bottom, after standing the neriantin separates out from this layer as an almost perfectly white flocculent mass, which after decanting off the ether can be collected on a filter. The removed ether, if shaken with water, usually yields a further quantity of neriantin.

After being dried over sulphuric acid neriantin forms a hard mass, resembling in colour and condition commercial gum arabic. If this be dissolved in hot absolute alcohol and the solution be very strongly concentrated on a water-bath, it assumes a brownish colour, and after long standing, without evaporation, the neriantin separates at the bottom of the vessel in the form of semiglobular brownish granules, the size of a pin's head (sphærocrystals). If the alcoholic solution, without being strongly concentrated, be allowed to stand for a considerable time in a glass vessel, the opening of which is simply covered with paper, a white layer of neriantin is gradually formed upon the bottom and sides of the vessel, which under the microscope appears to consist of closely aggregated roundish disks. The substance is in this way obtained perfectly pure with the greatest certainty. After drying it forms a chalk-white crumbly mass.

From the solution in alcohol and water neriantin separates after a time as a white gelatinous substance, which under the microscope appears to be composed of extremely fine, but very long felt-like interlaced threads. With a larger proportion of water in the hot concentrated solution the entire mass often gelatinizes very rapidly, so that a removal of the separated neriantin from the liquid is not possible. In this behaviour neriantin differs very essentially from digitalin, which under similar conditions takes a granular form, whilst under a very slow evaporation, lasting over a month, it crystallizes in very thin rhombic tables, with which some granules are always mixed.

Prepared in this way neriantin does not show a distinctly crystalline structure. But it is soluble in small proportion in ether, and from this it separates upon gradual evaporation of the ether in long, fine, flexible needles. But this method cannot be adopted for the preparation of large quantities of crystallized neriantin.

In respect of solubility in alcohol, water, ether, chloroform and dilute acids, as far as can be stated without quantitative determinations, neriantin behaves like digitalin. It contains no nitrogen and gives when warmed with concentrated hydrochloric acid a greenish-yellow colour, and upon treatment with concentrated

sulphuric acid and potassium bromide the beautiful red colour which is characteristic of digitalin. In this respect it might be referred to chemically pure digitalin.

On the other hand, neriantin differs from digitalin in the properties mentioned above and in its decomposition products. If a solution of neriantin in alcohol and water containing two or three drops of hydrochloric acid in 20 c.c. be boiled until the alcohol is driven off, a colourless pulverulent precipitate separates, which, examined under the microscope, appears to be composed of tolerably large four-sided pyramids, some more or less irregular and some well formed. The liquid filtered from the crystalline precipitate, after cooling, very strongly reduces cupric oxide in alkaline solution; so that neriantin must be looked upon as a glucoside, which under such treatment splits up into sugar and the crystalline body referred to. This, in analogy with "sapogenin" and "digitogenin," may be named "neriantogenin." Neriantogenin behaves towards concentrated hydrochloric acid and sulphuric acid and bromine like the unaltered neriantin, and like it is without any special action on the heart of a frog.

A more thorough investigation of neriantogenin could not be effected through want of material, but would be of especial importance to the chemical history of the peculiar active constituents of both the foxglove and the oleander. The peculiar reactions with hydrochloric acid and sulphuric acid, which distinguish almost all the oleander and digitalin constituents belonging to the digitalin pharmacological group, and reach their greatest purity and beauty in neriantogenin, indicate that in neriantogenin we have possibly to do with the nucleus which, in combination with other atom groups, especially the glucoses, gives rise to the active substances of those plants.

Neriantin, although a glucoside, does not produce the systolic pause in a frog's heart; at most it exercises a weak action, like saponin and digitonin. But it is not improbable that it originates from the very active oleandrin. Digitalein and digitalin give decomposition products which show the two reactions with hydrochloric acid and sulphuric acid and bromine most beautifully and are equally inactive, but have not hitherto been obtained crystallized. The fact appears to be, that the complete breaking up of these bodies results only from the action of stronger acids, which at the same time, as in the reaction with hydrochloric acid, gives rise to an alteration in the nucleus. The decomposition products are therefore almost all yellow or yellow-green.

From digitalin and digitalein there is formed first, upon heating with dilute acids, digitaliretin, and from this, through prolonged boiling with concentrated acids, the yellow-green inactive amorphous decomposition product. It might, however, be possible to effect by other means a splitting off, without a more fundamental decomposition, and thus to obtain a well-characterized crystallizable derivative.

Upon being kept digitalein, as before mentioned, gradually undergoes alteration, a colourless flocculent substance, insoluble in water, being formed, which gives the corresponding reactions with hydrochloric acid and sulphuric acid and bromine. This would appear to be the decomposition product corresponding to neriantin.

The difficulty in procuring these substances in large quantities makes it almost impossible to carry out an exhaustive chemical investigation of them. Digitalein is the most easily obtained, from the German commercial "digitalin." But the material alone for one kilogram of substance would cost five or six hundred pounds (10,000 to 12,000 marks). For the preparation of one kilogram of digitalin at least five or six thousand kilograms of dried digitalis leaves would be required.*

* An exhaustive list of the pharmacological literature of the oleander is appended to the original paper.

INSECTS INJURIOUS TO DRUGS.*

BY WILLIAM EDWIN SAUNDERS, PH.G.

In this paper is given simply what has been noted by the writer during a study of these insects extending over more than a year.

Sirodrepa panicea.—This is the elliptical, reddish-brown beetle, about one-eighth of an inch long, which is found in almost every edible drug, and in some, such as aconite root and capsicum, that would be pronounced far from edible. In addition to these two drugs I have found it in bitter almonds, sweet almonds, angelica, boneset, calumba, chamomile, chocolate, coriander, dandelion, elm bark, ergot, extract of licorice, German chamomile, orris root, prince's pine, rhubarb, squill, and sweet flag.

The larva is white with a brown head, is about twice as long as the beetle when full grown, although it is seldom or never seen stretched out at full length, always remaining curled up in a ball. It will in time fairly honeycomb a piece of root with small holes about one-twenty-fifth of an inch in diameter, at the end of which it is generally to be seen at home. Under the influence of camphor, these larvæ become uneasy, but being apparently unable to crawl away, resign themselves to their fate, and seem to thrive just as well with camphor as without it.

Calandra remotopunctata.—This is a small black beetle, about the size of the last, with what is popularly termed a "snout" projecting from the front of the head downwards. Under the microscope the back, thorax, and head are seen to be finely pitted, giving the insect a rough appearance. It was found in large numbers, the larva feeding on pearl barley, inside of which it lives, the egg being probably laid in the grain by the parent, and on hatching, the little insect makes its home there, eating all but the shel and sometimes attacking the grain from the outside.

Tenebrioides mauritanica, a species of "meal-worm," was found in pearl barley, and one specimen in calumba. It is a dark brown beetle, five-sixteenths of an inch long, the head and thorax forming nearly half the total length, and the mouth being fringed with hair. The back, which at first sight appears perfectly smooth, proves to be, when examined under the microscope, longitudinally corrugated. The larva is nearly half an inch long, white with a brown head, and between the jaws is a row of hair as in the perfect insect. The posterior end is furnished with a pair of jaws very similar, though, of course, for a different purpose.

Trebolium ferrugineum is a flat reddish-brown beetle, about one-eighth of an inch long, appearing smooth to the naked eye, though the microscope shows the back numerously pitted. These insects affect patent foods and similar substances, and the beetles are possessed of remarkable longevity, as proved by the fact that I have kept a few alive for two months in a small box with a little cercalina, which seems to be their favourite food. Whether the beetles themselves eat it or not I do not know, but they certainly have a liking for the dead bodies of other beetles.

Silvanus surinamensis is a narrow, brown beetle, almost one-eighth of an inch long, with a pitted and longitudinally corrugated back. One specimen only was found, on anthemis.

Anthrenus rarius.—This insect has been found only in cantharides, but I believe also attacks other animal drugs, such as castoreum. During the month of July there emerges from the egg a very active larva, densely covered on the tops of the segments with stiff brown hairs, which at the posterior end point towards the centre of the back, forming a ridge, and when the insect is annoyed, it has the power of dividing the ridge in the centre and throwing half down on each side in a fan-like position,

* From an Inaugural Essay presented to the Philadelphia College of Pharmacy. Reprinted from the *American Journal of Pharmacy*, April, 1883.

the object of which movement could not be determined. When the insect has been feeding on the whole cantharides, all these hairs on the back become rubbed off, those forming the ridge being generally last to go, because, being on the downward slope of the body they are not exposed to the same amount of friction. Underneath, however, the hairs are shorter and do not become rubbed off as on the back.

The larva consists of eleven segments, those at the ends being of a much deeper brown than those towards the middle, and the six legs being inserted on the three anterior segments, each furnished with a short, straight claw. The skins are shed quite often during the larval state, and are discarded by a slit nearly the length of the back, terminating indifferently at either end, and through which the insect emerges. The shed skins present a beautiful irridescent appearance under the microscope when viewed by reflected light.

These larvæ feed on the cantharides all winter, and, if in quantity, commit great havoc, leaving only the hard exterior portions untouched, such as the upper portion of the thorax, the green wing-cases and transparent wings. When their legitimate food gives out they have no compunction about first eating their dead parents, and then each other; but on this diet they do not seem to thrive so well.

The beetle emerges in May or June, and is about one-eighth of an inch long, oval, and black, the upper parts being marbled and streaked with whitish and rufous hairs, which are rubbed off after death if the insect is subjected to any rough usage.

Camphor does not kill these larvæ, and after keeping some for a day in a small box about a quarter full of camphor, the only thing worthy of remark in their actions was that they did not seem quite so lively as those kept without it. That they have a distaste for it, however, is proved by the fact that some which were put in a box with holes in it, left the box during the night. The Pharmacopœia direction to keep camphor with the cantharides is, therefore, not a *remedy*, but merely a preventive measure, and not a very good one either. The vapour of chloroform rapidly kills them, so that by putting a small quantity of chloroform in a gallipot on the top of the infested cantharides, the heavy vapour will sink through it and destroy them.

PHOSPHORUS AND A NEW METHOD OF EXHIBITING IT IN PILL-FORM.*

BY H. H. MILLHOUSE.

In choosing the above title as the subject of my dissertation, I would remind you that I am not the first who has been engaged in this field of inquiry. It is well known that many pharmacists have written much on this subject, and for that reason a new form of the administration of phosphorus is looked upon with suspicion, and often after a short time sinks into oblivion. My object is really to introduce to your notice an account of the experiments I have made and of what appears to me to be a new form of exhibiting this remedial agent in solid, *i.e.*, in pill form, which shall contain phosphorus in a free and unaltered state. I may preface my remarks by stating that the kind of phosphorus used was the one recognized in the British Pharmacopœia, viz., the ordinary or vitreous variety.

The medicinal value of uncombined phosphorus is dependent upon it being exhibited in a free, unoxidized and finely divided form, uniform in composition, easily and gradually assimilable, and mixed with ingredients, which do not cause decomposition, do not derange the stomach of the patient, nor counteract the action of the phosphorus.

* Abstract of paper read before the Chemists' Assistants' Association, March 28, 1883.

On reference to several standard works on materia medica and various other sources we find that many medical men raise objections to the administration of phosphorus in solid form, each having different reasons for his assertions. Pereira says it should never be given in solid form, not even in pills. On the other hand Neligan remarks as follows:—

"It is generally stated that phosphorus should never be administered in solid form. If strictly interpreted this is perfectly correct, but it is not so if it be understood that phosphorus may not be administered in the form of pills, as in my opinion this is by far the best and safest way of exhibiting it."

Dr. Kirby in referring to the danger consequent upon the preparation of phosphorus pills, says:—"Bearing in mind the exceedingly poisonous properties of phosphorus and the great difficulties attending its pharmacy and its uncertain action when improperly prepared, I have refrained from publishing the details of my process, which it would be dangerous to undertake, without experience, preferring that its preparation should have proper personal supervision." In spite of this I venture to say that the average pharmacist of our own day is fully competent to undertake without risk the preparation of his own pilula phosphori when a suitable formula is presented to him.

I commenced my experiments by preparing pills from the official formula for pilula phosphori (for which I will refer you to the 'Additions to the British Pharmacopœia'). You will probably agree with me in saying that it is unsatisfactory. My reasons are briefly these. 1st. It is too hard and insoluble, for it has been known to pass through the body unchanged; 2nd. The quantity of phosphorus per cent. is too small, and consequently when other ingredients have to be added it makes the pills inconveniently large; 3rd. Being of light materials, 3 grain pills (usual dose of phosphorus $\frac{1}{30}$ of a grain) are when coated with an ethereal solution of such substances as tolu, sandarac, etc., sugar or chalk, too large. The recommendation to keep under water is both inconvenient and objectionable, the former because when a quantity is to be weighed out great care has to be taken to squeeze out all the adherent moisture, which when soap, spirit, or extracts are added causes the mass to become too soft, the latter because the amount of oxygen naturally taken up by water (4 per cent.) might cause some oxidation of the phosphorus, and thus weaken the preparation. This perhaps might be rendered less objectionable if the vessel containing the mass were filled to the brim with well-boiled and cold distilled water. No doubt other objections may be raised. The French Codex and also the recently published Pharmacopœa Germanica (1882) give no formula for phosphorus pills. I then made some from the formula of the last edition (1882) of the United States Pharmacopœia, which is as follows:—

Take of—

Phosphorus	1 grain.
Powdered althea	80 grains.
Acacia in fine powder	20 „
Glycerine	40 „
Water	20 „
Purified chloroform	50 „
Balsam of tolu.	
Stronger ether (94 per cent.)	q.s.

Dissolve the phosphorus in the chloroform, mix the powdered althea and acacia in a mortar, add the solution of phosphorus, then the glycerine and the water, make into a mass and divide into 100 pills. Coat with a solution of 1 part of balsam of tolu in 1 part of the stronger ether and keep in a stoppered bottle.

Among other suggestions that I have found are the following:—In a paper read at an Evening Meeting of the Pharmaceutical Society in 1873, A. W. Gerrard proposed the use of resin as a solvent. Tolu as a vehicle for pills was recommended by A. C. Abraham in 1874. W. H. Walling, in 1875, pointed out that cacao butter was a good solvent.

Twenty-five grains of phosphorus were agitated with 300 grains of cocao butter until dissolved, and then 200 grains of powdered soap added and shaken until uniformly mixed, which gave a nice combination. W. B. Addington, in the same year, proposed incorporating a solution of phorphorus in carbon bisulphide with a suitable extract, continuing the trituration until the solvent had evaporated. Barnard Proctor recommended a similar formula in which the extract is replaced by soap, tragacanth, liquorice powder and confection of roses. E. Lilly, in 1876, suggested fusing phosphorus under syrup, shaking well so as to finely divide it, then mixing the phosphorus thus divided with flour. Mandl employed the following formula :—

Take of—

Phosphorus	5 centigrams.
Carbon bisulphide	20 drops.
Almond oil	18 grams.
Carbonate of magnesium .	q.s.

Make fifty pills and coat with gelatine.

Tavignot used a pill prepared from an oily solution alone, thus avoiding the objectionable ingredient unnecessarily employed in Mandl's formula.

Balsam of Peru, yellow and white wax, Canada balsam, silica, crumb of bread, borotartrate of sodium, resin, spermaceti, albumen, storax, suet, lard and phosphate of calcium, have also been from time to time recommended as excipients.

The objections which have at different times been raised against the numerous published formula are manifold and various; some of these are subjoined. Cacao butter melts too quickly in the stomach, causing unpleasant eructations and is too difficult to manipulate, and when mixed with tragacanth powder or other plastic ingredients neither of these objections is obviated. Mr. Gerrard's phosphoretted resin process has, in my opinion, as many objections as the British Pharmacopœia one; the complicated mode of preparation is alone sufficient to condemn its adoption, even by those pharmacists who are anxious to follow as far as practicable the advice meted out to them in an eloquent address by a respected professor of chemistry. Then, as Dr. Méhu has remarked, the process is very dangerous and during the operation a portion of the phosphorus passes into the amorphous or insoluble form, the resin being supersaturated with phosphorus. At a high temperature it would probably separate into solid fragments on cooling, and be very liable to oxidation during the pulverization of the resin. Lard and other readily oxidizable organic compounds become rancid and assist the oxidation of the phosphorus.

Personally my troubles with this preparation have been very great, especially when other things have to be added, and I imagined that a formula with a basis having qualities as above described would be a desideratum, so I began by looking up the literature of the subject with the foregoing result. I have tried a great many formulæ, most of which are given below, and they have been prepared both in mass and divided into pills coated with different coatings.

No. 1. Is the B.P. mass rolled out into 3-grain pills and varnished with a solution of sandarac in ether. For objections see above.

No. 2. Are 3-grain B.P. phosphorus pills, each containing in addition $\frac{1}{4}$ of a grain of powdered hard soap. This addition has been recommended by medical men and others to prevent the pills passing through the body unacted upon; it, however, makes them more difficult to manipulate, since they have a tendency to split, and of course they are too large; less soap ($\frac{1}{6}$ or $\frac{1}{8}$ of a grain) would perhaps suffice.

No. 3. Consists of—

Phosphorus	5 grains.
Mutton suet	250 grains.
Powdered liquorice	145 grains.
Powdered mastich	50 grains.
	(1 part of phosphorus in 90).

Melt the suet, add the phosphorus, digest with agitation over a water-bath until dissolved; now pour the solution upon the powder previously well mixed, thoroughly dried, and placed in a stoppered bottle standing in hot water so that the melted suet is not chilled, but readily mixed by violent agitation with the powder. When divided into 3-grain pills each pill contains $\frac{1}{30}$ of a grain of phosphorus. They are large and in consequence of the basis being bulky, inconvenient to mix with other ingredients. Possibly they would be improved if a larger percentage of phosphorus were added.

No. 4. Contains—

Phosphorus	2 grains.
Powdered liquorice	120 grains.
Carbon bisulphide,	
Chloroform, of each a sufficiency.	
Glycerine of tragacanth	76 grains
	(1 part of phosphorus in 99).

It was prepared by carefully dissolving the phosphorus in 20 minims of carbon bisulphide, pouring the solution upon the liquorice powder contained in a mortar, mixing thoroughly and making into a mass with the glycerine and tragacanth paste, keeping the vapour of chloroform present during the entire process to prevent undue oxidation. $\frac{1}{33}$ of a grain of phosphorus will be contained in every 3 grains of the mass. This method is frequently resorted to when medical men order phosphorus in the form of pills without giving any basis or guide as to the way in which they wish it to be dispensed. This is the principle carried out in the United States Pharmacopœia. It is objectionable, as it retains the smell of the carbon bisulphide, and cannot safely be preserved in mass.

Carbon bisulphide, which is capable of dissolving phosphorus with greater rapidity and in larger proportion than any other solvent, has also been used in the manufacture of pills by Mandl, Proctor, and many others. M. Gubler has pointed out the fact of it possessing, in a notable degree, the power of counteracting the effect of free phosphorus. It imparts an offensive odour and taste to all preparations in which it has been used; probably even when, as in Mr. Proctor's process, the evaporation of it is calculated upon, the smell of the solvent is retained, and unless very dexterously made, some of the solvent itself.

No. 5. This is a sample which I have procured from one of the leading dispensing establishments in the West-End, and, if in the hands of a clever manipulator, may be rolled out into nice-looking pills, especially when coated with gelatine; but they, however, very quickly become sticky to the touch and unmanageable. The basis of this probably consists chiefly of cacao butter (the ordinary basis for suppositories) and tragacanth. I am informed that 1 part of phosphorus is contained in 60 parts of the mass, a 2-grain pill will therefore contain the usual dose of phosphorus, $\frac{1}{30}$ of a grain, but the ingredients being evidently light, this size pill is proportionately large.

No. 6. This was also obtained from a well-known firm, is similar in its appearance and behaviour to No 5, and is probably of the same composition with a little soap added. These two preparations (No. 5 and 6) struck me as likely to produce those disagreeable eructations it is so essential to avoid, and my assumption was verified by actual experiment "in vili corpore," for within half an hour of taking a 2-grain pill, I experienced a slight yet disagreeable burning sensation in the stomach, and unpleasant feeling in the throat with the usual "*brimstone-like*" eructation.

No. 7. From a large City dispensing establishment. It is of much better consistence than the two preceding ones, and rolls out well. From its general behaviour I imagine it is slowly dissolved in the stomach and the phosphorus gradually absorbed. From the odour of the mass I should say carbon bisulphide has been used in its preparation, which, together with it being a private

formula, is the only objection I can raise against it. I am given to understand that 1 part of phosphorus is contained in 50 parts of the mass; hence, each 2-grain pill contains $\frac{1}{25}$ of a grain of phosphorus, thus allowing of other ingredients being added without rendering the pills inconveniently large. By examination it seemed a probable mixture of liquorice, soap, mastich, phosphorus and moisture.

No. 8. Is an advertised English nostrum which I was unable to procure in mass, it being only sold in divided pills with a white coating; as we are told, it is necessary to have it divided into pills and coated directly it is made, or oxidation of the phosphorus would take place, a fact which of itself would prevent its adoption for general pharmaceutical purposes. The basis probably consists of an inert powder, with extract of gentian. I examined the coating and found it was easily detached when placed in warm water, and was composed of French chalk, sugar and gum.

No. 9. Was the following formula:—

Take of—

Phosphorus	8 grains.
Vaseline	196 grains.
Paraffin wax	36 grains.
Phosphate of calcium	240 grains.
(1 part of phosphorus in 60).	

The wax and vaseline were melted together by the heat of a water-bath in a stoppered bottle, the phosphorus added while warm and shaken until dissolved, continuing the agitation until cold. It was then carefully mixed in a mortar with the phosphate of calcium. Here a peculiar phenomenon was noticed immediately after mixing, heat being developed and the mass assuming a semi-solid condition and remaining so in spite of the addition of more phosphate of calcium; when all what seemed to be chemical action had ceased, it gradually acquired a more solid form. This was not proceeded with but laid aside for future investigation, the cause of which peculiar action I hope to be able soon to explain.

No. 10. Consists of:—

Phosphorus	4 grains.
Powdered myrrh	46 grains.
Paraffin wax	30 grains.
Vaseline	70 grains.
Kaolin	90 grains.
(1 part of phosphorus in 60).	

The paraffin wax and vaseline were melted together in a porcelain capsule by the heat of a water-bath and poured into a wide mouthed stoppered bottle previously thoroughly dried and warmed by standing in hot water; the phosphorus was now added and the whole briskly agitated until the phosphorus had dissolved and the mixture had finally solidified; when quite cold it was made into a mass with the kaolin and powdered myrrh, previously well mixed in a mortar. This mass is not difficult to manipulate, though it is rather soft in consistence and the pills do not varnish nicely. When divided into 2-grain pills, each pill contains $\frac{1}{30}$ of a grain of phosphorus.

No. 11. Is of the following composition:—

Phosphorus	4 grains.
Cacao butter	100 grains.
Prepared mutton suet	100 grains.
Powdered tragacanth	36 grains.
(1 part of phosphorus in 60).	

The cacao butter and suet were melted as described in No. 10, and transferred to a similar stoppered bottle, the phosphorus added and shaken until dissolved and while the mixture was still liquid the powdered tragacanth was introduced and the whole violently agitated until uniformly mixed. The objections to Nos. 5 and 6 will apply to this.

No. 12. Is composed of:—

Phosphorus	4 grains.
Paraffin wax	130 grains.
Vaseline	70 grains.
Powdered tragacanth	36 grains.
(1 part of phosphorus in 60).	

The paraffin wax and vaseline were melted by the heat of a water-bath, and the same mode of preparation adopted as in No. 11.

No. 13. Contains:—

Phosphide of zinc	4 grains.
Powdered althea	20 grains.
Resin ointment	24 grains.

Make a mass and divide into twenty-four pills.

This can scarcely be called a mode of exhibiting phosphorus in the free state, inasmuch as an acid must be present in the stomach, causing decomposition with production of nascent hydrogen, which combining with the phosphorus forms phosphoretted hydrogen, and is thus absorbed.

This has, however, of late years been largely prescribed by the medical profession and I find such a combination as the one above to give satisfactory results.

In concluding my list of formulæ, I would specially direct your attention to the following, the latter of which I am given to understand is quite a new method for giving a satisfactory basis for the administration of phosphorus.

No. 14. Consists of—

Phosphorus	5 grains.
Benzoated lard	250 grains.
Phosphate of calcium	205 grains.
Carbonate of calcium	20 grains.

Melt the lard by means of a water-bath, transfer to a strong stoppered and perfectly dry glass bottle made warm, add the phosphorus, shake until dissolved, then pour the solution upon the powders, previously well mixed and contained in a similar stoppered bottle, kept warm by standing in hot water, shaking briskly until the mass is thoroughly uniform in consistence. Each 3-grain pill contains $\frac{1}{30}$ of a grain of phosphorus in the free state.

No. 15. Consists of—

Phosphorus	4 grains.
Powdered mastich	30 grains.
Paraffin wax	50 grains.
Vaseline	66 grains.
Kaolin	90 grains.

Melt the wax and vaseline together in a porcelain capsule by the heat of a water-bath, place them in a strong glass stoppered bottle, previously warmed by allowing it to stand in an oven or other warm place, add the phosphorus (care being taken that the mixture is not too hot, a temperature of 140° F. being quite sufficient to fuse the phosphorus), and shake briskly until cool; when quite cold rub carefully in a mortar with the kaolin and powdered mastich, previously well mixed, until a uniform mass is obtained. It should be kept in a covered pot.

The vaseline used in the foregoing formulæ was kept in an evaporating dish at a temperature a little above its melting point for twelve hours, in order to dissipate all trace of moisture.

These two formulæ, Nos. 14 and 15, I feel confident in strongly recommending, presenting as they do to every pharmacist a practical method of dispensing phosphorus in the free state. Both are easily prepared, and if ordinary care is exerted, the danger of oxidation of the phosphorus is reduced to a minimum. The masses are of a good consistence and easily rolled into pills which possess the advantage of being small in size (in No. 15, more especially, the ordinary dose of phosphorus, $\frac{1}{30}$ of a grain, being contained in a 2-grain pill, which when coated with gelatine is considerably smaller than a 2-grain B.P. quinine pill), and thus convenient to mix with other

ingredients, are readily but not too quickly disintegrated in the stomach; consequently the phosphorus is gradually absorbed into the system. Having taken several, I have experienced no unpleasant eructations, but a sensation (after a few hours have elapsed) of what the French would term *bien être*, thus leading me to believe that the active ingredients of the pills had been assimilated. I have used several different coatings (some specimens of the pills coated with them are upon the table), including sandarac varnish, gelatine, isinglass, French chalk, and a mixture of gelatine, sugar and gum acacia dissolved in water; but as pill coating might be made the subject of a very useful and valuable paper by some one of our members, I will merely content myself with according my preference to the latter for coating phosphorus pills, which is but a slight modification of a process recommended in a paper by Clay W. Holmes and published in the *Pharmaceutical Journal*, December 23, 1882. It, however, requires a certain amount of practice before the operator is able to employ it satisfactorily.

Several of my pills were coated by merely placing one on either end of a piece of fine wire bent in horse-shoe fashion, dipping them into the liquefied coating solution and hanging on nails until the coating had firmly set. This, though a tedious process, is nevertheless a very good one, and more easily managed than the pin process advocated by Mr. Holmes.

Before coating with French chalk (pearl coating), these pills should be varnished with an absolute alcoholic solution of sandarac, or other suitable alcoholic solution, ether partially dissolving the basis employed in their preparation.

I should recommend the mass to be kept in a covered pot, in boluses of about two drachms each, wrapped in wax paper to exclude the air and prevent any consequent liability of the phosphorus becoming oxidized. The different masses I have prepared (and placed on the table) have all been kept several months without this precautionary measure having been taken and no deleterious effects have ensued.

I have mixed No. 15 mass with various ingredients, including the following; in each case satisfactory results have been obtained.

No. 16. Contains in each pill—

No. 15 mass . . .	2 grains (equivalent to $\frac{1}{30}$ of a grain of phosphorus).
Sulphate of quinine	1 grain.

This requires no excipient and makes a very nice and workable pill.

No. 17—

No. 15 mass	2 grains.
Sulphate of quinine	1 grain.
Reduced iron	2 grains.

With the addition of a small quantity of glycerine of tragacanth and balsam of Peru these make good and convenient sized pills.

The following method was adopted for approximately estimating the comparative melting points and probable points of absorption of each in the stomach.

A beaker, having a capacity of 10 fluid ounces, was placed upon a tripod and two-thirds filled with cold water, and in this was placed a test tube (an inch in diameter and 5 inches in length), also two-thirds filled with cold distilled water previously boiled, in which was suspended a very sensitive mercury thermometer dipping nearly to the bottom of the test tube. 5 grains of the mass to be tested was placed in the test tube; heat was then applied by means of a Bunsen's burner to the beaker, in such a manner that the temperature rose exactly 1° Fahrenheit per minute, each degree rise being accurately noted. The temperature was taken down at which the mass altered in consistence or otherwise; and to the water contained in the test tube was added, after the experiment was completed, a weak solution of litmus to see if any acid of phosphorus was present. The subjoined are the results obtained:—

Number of pill.	Softens.	Very soft.	Disintegrates.	Remarks.
1 . .	104° F.	114° F.	122° F.	
2 . .	98°	108°	115°	
3 . .	79°	88°	105°	
4 . .	82°	89°	110°	
5 . .	82°	89°		This melts and floats on the top of the liquid at 89° F.
6 . .	77°	82°	86°	Melts at 86° F.
7 . .	79°	88°	105°	
8 . .	102°	114°	118°	Coating readily removable at 102° F., completely dissolved at 130° F.
9 . .				*Vide* remark under this head.
10 . .	90°	98°	102°	
11 . .	84°	90°		Melts and floats on the top of liquid at 90° F.
12 . .	85°	93°	94°	Melts at 94° F.
13 . .				Phosphide of zinc.
14 . .	86°	95°	104°	
15 . .	91°	100°	106°	

The waters in which Nos. 1 and 2 were separately digested, each gave an acid reaction on the addition of a weak solution of litmus. The different portions of water in which the other samples had been individually digested, remained neutral to the litmus solution.

LUMINOSITY OF FLAME.*

BY W. SIEMENS.

The luminosity of burning gases is a secondary phenomenon dependent on the separation and incandescence of solid particles suspended in the flame. Gases from which no such particles are separated burn with a feebly luminous flame, and this luminosity is attributed to the incandescence of the gases themselves. No experiments have hitherto been made to ascertain whether pure gases heated to a high temperature really emit light. In order to examine this point, the author's brother made a series of observations with a Siemens regenerative oven, of the form used in the hard glass manufacture, whereby a temperature of the melting point of steel, 1500–2000° C., could easily be attained. By a suitable contrivance the interior of the oven could be examined, and it was thus found that, provided the experimental room was kept perfectly still, the heated air in the oven emitted no light. The introduction of a luminous flame into the oven caused its interior to be only feebly illuminated. As a result of these experiments, it follows that the supposition that the luminosity of the flame is due to the incandescence of the gas is incorrect. In order to determine the temperature at which luminous flames become non-luminous, the author suggests a repetition of the above experiments with a more refined apparatus. The heat-rays emitted from hot gases are very small in number as compared with those emitted from equally hot solid bodies.

Observations on the behaviour of flames themselves prove equally that the luminosity of flames is not due to the incandescence of the products of combustion. If the gases to be burnt are more quickly mixed, the flame becomes shorter, since the process of combustion is accelerated, and hotter, since less cold air is mixed with the burning gas. The same phenomenon occurs if the gases are strongly heated before they are burnt; but since the ascending products of combustion are maintained for a short time only at the temperature of the flame, the above phenomenon would be reversed were the gases self-luminous. The luminous part of the flame is separated by a line of demarcation from the products of combustion, and is coincident with the termination of chemical action, which is probably the cause of the emitted light.

* From *Ann. Phys. Chim.*, [2], xviii., 311–216. Reprinted from *Journal of the Chemical Society*, May, 1883.

The Pharmaceutical Journal.

SATURDAY, MAY 12, 1883.

Communications for the Editorial department of the Journal, books for review, etc. should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE ANNUAL REPORT.

THOUGH the Anniversary Meeting of the Society will not be held this year until a week after the usual time, the Report of the Council upon the transactions of the past year is already in the hands of the Society's members, and as the hopes which have been entertained of a satisfactory amendment of the law relating to the practice of pharmacy are still deferred, attention will naturally be directed in the first place to that portion of the Report which deals with this subject. As regards the Pharmacy Acts Amendment Bill, which has been submitted to the Privy Council, the position of the Council is still only one of expectancy, and it is unable to do more than state that the draft Bill is engaging the attention of the Government. That the result of the deliberations on the Bill will be favourably influenced by the very general approval it has met with from the Society's members and from the trade at large may reasonably be anticipated; but it must be remembered that if the Bill should be eventually introduced into Parliament there will still be need of the hearty support and thoroughly united action of the entire pharmaceutical body in order that it or any Pharmacy Acts Amendment Bill shall become law. This necessity is forcibly expressed in the Report of the Council, and we trust its appreciation will be so general as to strengthen the hands of the Society's executive for its endeavour to promote the interests of pharmacy and enable it effectually to urge the claims of those engaged in that business.

As bearing upon this point, we may refer to the circumstance that the period has arrived for the members of the Society to manifest their interest in the constitution of the executive body by which they are represented, and in whose hands is placed the power of dealing with such matters as affect their interests. In former years it has afforded ground for regret that a large proportion of those entitled to vote have failed to send in their papers at all or in time to comply with the requirements for their acceptance. We feel sure that this disregard of the exercise of so important a function must be due to a want of proper appreciation of what is requisite from every one connected with the Society. If it be expected that the Council of the Society is to have any useful influence in regard to contemplated legislation, or otherwise as a representative of the pharmaceutical body, it must be evident that the extent to which such a power exists will depend upon the general hearty support the Council receives from all the members of that body. It is to be regretted that so many of them do not belong to the Society; but it is still more matter for regret that among its members there should be any who give reason for supposing that they are indifferent as to who are elected to represent them in the way we have referred to.

As a matter closely connected with special pharmaceutical legislation, the introduction of a Medical Acts Amendment Bill into Parliament is next referred to in the Council Report. As we have already pointed out in a former article, this Bill does not propose to interfere in any way with the legitimate exercise of the business of chemists and druggists; but in regard to one of the duties with which the proposed newly constituted Medical Council is to be charged, the Bill fails to do justice to the claims of pharmacists since it does not provide for any such representative recognition of pharmacy as obtains in all other countries in the production of a national Pharmacopœia. The Council of the Pharmaceutical Society has, on several occasions, had this subject under consideration, and has expressed its sense of the desirability of practical pharmacists being officially associated with medical men in carrying out the work of revising the Pharmacopœia. The Medical Bill, however, merely adopts the provisions of the existing law that the Medical Council shall from time to time cause to be published under its direction a British Pharmacopœia. According to the practice hitherto followed the work of revision would thus be done by a committee of the Medical Council consisting solely of medical men and assisted by such chemical, pharmaceutical and other experts, as it may deem desirable to engage, for the sake of making their special knowledge available.

This mode of carrying out the work of Pharmacopœia revision for Great Britain and Ireland is, however, one that does not accord to the possessors of pharmaceutical skill such a position as is consistent with the advance that has been made during late years in their educational and practical qualifications. The Council is therefore taking steps to obtain an amendment of the clauses of the Medical Bill, when it comes before the House of Commons in Committee, of such a nature as to provide for the adequate representation of practical pharmacists in the body charged with the preparation of a national Pharmacopœia.

In the effort to be made in this direction, the Council of the Pharmaceutical Society of Ireland has expressed its willingness to co-operate, and it is but natural that a desire should be entertained on the part of Irish pharmacists to have a voice in the preparation of a book which constitutes the law by

which they are to be bound, no less than their English and Scotch colleagues.

The unexpected prominence that has been given to this matter by the recently disclosed proceedings of the present Medical Council, has led to some expression of dissatisfaction on the part of the President of the Pharmaceutical Society of Ireland, on the ground that the principle of centralization had been applied in such a way as to leave the Irish Society out in the cold; but however much we are disposed to acknowledge that Irish pharmacists have not been considered as they should be, we cannot admit the justice of the complaint so far as the Council of the Irish Society is concerned. On the contrary, it might be contended that there is some ground for charging the Council of the Irish Society with complicity in the arrangement entered into between the Pharmacopœia Committee of the Medical Council and the professors of this Society. At any rate the Pharmaceutical Society of Ireland is to some extent represented in that Committee by its Vice-President and another of its members. If therefore the Irish Society feels aggrieved by the revision of the Pharmacopœia being placed in the hands of three English professors, how much more reason is there for English and Scotch pharmacists to complain of those members of the Irish Council who have helped to prevent the general emancipation of British and Irish pharmacy that might have been promoted by them as members of the Pharmacopœia Committee of the Medical Council.

The present aspect of this matter is, we think, such as to render it one of especial importance to the pharmacists of all parts of the Kingdom, and it would seem to offer an excellent opportunity of urging upon the Government the reasonable claims of pharmacists to recognition. We believe that it is contemplated to submit to the Privy Council a memorial embodying the views of the Council and stating the general case on which action is to be taken. The substance of this memorial will be communicated to the Local Secretaries of the Society for their information and guidance in the endeavour to organize measures for supporting the Council. By this means it will be possible to bring influence to bear upon members of Parliament through their constituents in various parts of the country, with a view of ensuring their aid when the Bill comes before the House of Commons. Of course it will not be until after the Whitsuntide holidays that anything can be done in Parliament; but the interval that will elapse before the Bill is taken in Committee will furnish opportunity for doing the work required, and the coming anniversary gatherings will enable members of the Society to confer together as to the best mode of being severally useful in this important movement.

The financial statement is a very satisfactory feature of the Council Report, showing that the income for the past year exceeded the expenditure by more than one thousand pounds, and it is to be anticipated that this good result will be continued by the improved investment of the Society's capital as proposed for the future in freehold ground rents.

The Benevolent Fund has been considerably augmented, not only by several legacies, but also by the subscriptions sent in through the efforts of the Local Secretaries, who have so zealously given their services for the promotion of that object. It is to be hoped that the publication of local lists of subscriptions and donations, commenced last February in the *Pharmaceutical Journal*, will materially assist towards further advocating the claims of the Fund amongst those who have not hitherto contributed to it from not having had their attention called to the pressing claims for relief which the Council has made upon it constantly from all parts of the country.

The Evening Meetings held during the past session have been more than ordinarily well attended; the papers read have been numerous as well as important, and the participation of younger members in the discussions has afforded much satisfaction.

The Library has been augmented by the addition of five hundred books and pamphlets, and that its importance has received due attention we may infer from the fact that it has been visited by more than a thousand readers during the year.

The Museum has been enriched by several gifts from the Government of medicinal plants from the Botanic Gardens at Ceylon, and cinchona bark from Jamaica and Madras. Dr. PARKER has also presented a number of interesting drugs from Madagascar.

During the past year the subjects of education and examination have received much consideration from the Council; but for the present we defer any further detailed reference to the changes that are contemplated in this direction, as the course to be taken in regard to them would depend much upon the future progress of the Bill which the Council has submitted to the Privy Council.

It is with pleasure we mention the Council's intention of recommending the members to pass a bye-law to allow of the election of corresponding members. It is so desirable that the interest which many eminent men take in pharmacy should be enhanced by some official recognition on the part of the Society, as the labours and services of British pharmacists in the same direction are recognized by Continental and American associations, that this mode of associating with the Society distinguished pharmacists and others residing permanently outside the United Kingdom has been thought to be especially adapted to further the interests of the Society and promote the objects which it has in common with those who might thus be attached to it in the character of corresponding members.

We are requested by the Secretary to mention that through an oversight the words "for the use of the Council only" were printed on the copies of the Report intended for the Members and Associates, and that in some instances these words were not erased.

* * *

Another Medical Bill has been introduced into the House of Lords by Lord O'Hagan, and read a second time on Thursday, but its sole object is to amend the Medical Act of 1858 and to confer upon the Royal University of Ireland the power to appoint a member of the Medical Council formerly exercised by the Queen's University in Ireland, now dissolved. If, however, the Government Bill should pass, the necessity for this second Bill would be superseded.

* * *

In reply to the application of the Committee of the Vienna International Exhibition the Imperial Minister of Finance has granted the privilege of introducing into Austria, duty free, such goods intended for the Exhibition as are not sold in the country. The State Railway Department has also decided to charge the usual tariff for conveying goods to the Exhibition, but to make no charge for the return carriage.

* * *

The New York correspondent of the *Standard* states that at a recent auction sale of quinine an aggregate amount of a ton and a half was sold. This is the largest peremptory sale of quinine that has yet taken place in America. It may be added that a few days since there was a sale of sixteen thousand ounces of quinine sulphate in London, and it is understood that a sale of a similar quantity is to take place shortly in Berlin.

* * *

In the *Journal de Pharmacie* for the present month there is an interesting note by Messrs. Regnauld and Villejean on an analysis of some bark from a plant of *Cinchona succirubra*, which had been grown in the open air in the botanical garden of the Faculté de Médecine, Paris. Notwithstanding the unfavourable conditions, climatic and otherwise, under which the plant was reared, the bark is said to have yielded 1·47 per cent. of quinine and 1·05 per cent. of cinchonine.

* * *

The last month has seen the completion of Messrs. Bentham and Hooker's great work, 'Genera Plantarum,' after a lapse of more than twenty-one years from the time when the first portion of the MS. was placed in the printers' hands. The complete work forms three large octavo volumes, written in Latin and printed in small type.

* * *

The *Journal of Botany* quotes the following estimate by Mr. Bentham of the number of phanerogamic plants at present known to science:—Polypetalæ: 82 orders, 2610 genera, 31,874 species. Gamopetalæ: 45 orders, 2619 genera, 34,556 species. Monochlamydeæ: 36 orders, 801 genera, 11,784 species. Gymnospermeæ: 3 orders, 44 genera, 415 species. Monocotyledons: 34 orders, 1495 genera, 18,576 species. Total: 200 orders, 7569 genera, 97,205 species.

* * *

By a recent Proclamation of the Governor of Victoria the schedule of poisons to the Sale of Poisons Act of that colony has been augmented by the addition of—Solutions or admixtures of arsenic, with some exceptions; all solutions or admixtures of strychnia and of other vegetable alkaloids and their salts; all preparations of corrosive sublimate; vermin killers, if preparations of poisons included in the first part of the schedule; solutions and preparations of chloral hydrate; red oxide of mercury; ammoniated mercury, and the tincture and all vesicating preparations of cantharides.

* * *

The *New York Tribune* reports a case in which damages to the amount of 100 dollars have been recovered against a druggist for injuries sustained by the plaintiff through negligence in dispensing a prescription. No more exact information is given as to the nature of the mistake than that a single dose caused the plaintiff to keep her bed for a month; but the defendant, while admitting that a mistake had been made, asserted that the compound ought not to have produced the ill effects complained of.

* * *

The authorities of the Californian College of Pharmacy appear to have invited a General Barnes to deliver an address on the occasion of their last graduating exercises, a compliment which he repaid with some very plain speaking upon the subject of the "patent medicine" trade. Singling out one preparation, "The Balm of a Thousand Flowers," he described it as follows:—"A mixture of oil, potash, alcohol and sugar, boiled together, and flavoured with musk; a bad liquid scented soap, capable perhaps of washing a dirty face and nothing more. Yet the advertisement alone of this fraud has cost over 100,000 dollars, which is said to have been profitably spent, and hundreds of thousands of bottles have been sold by reputable pharmacists, every one of whom knew it to be a fraud." The general's anger against the offending proprietor pursues him even beyond the tomb, and his wish as expressed was not exactly "*Requiescat in pace!*"

* * *

A little later, General Barnes's oratory took another flight. "Your patent medicine fiend swoops down upon humanity as soon as it is launched into the world, with soothing syrups that take the place of nature's healthy rest, and with artificial food better than the pure and healthy fountain which nature gives for its sustenance. It hangs over old age with the lying promise of the restoration of vitality, and squats at last upon its coffin, holding some embalming nostrum that shall make the corpse proof against the ravages of the worm." It is not surprising to learn that at the end of the "oration" one of the professors ventured to suggest that it was the public which most wanted educating in this direction, for as long as the public demanded patent medicines somebody would supply them, even if druggists did not.

* * *

If official reports are worth publishing at all, it is desirable that they should appear within a reasonable interval from the period to which they refer. This can hardly be said of the Eighteenth Annual Report by the Inspector under the Alkali Acts, which was issued a few days since. This report refers to proceedings in the year 1881, is supplemented by a short note dated August, 1882, and is presented to Parliament in May, 1883, after many of the conditions discussed in the report have been affected by fresh legislation.

Transactions of the Pharmaceutical Society.

Errata.—Page 902, col. 2, line 25 from bottom, *for* Barnes, James Burdon, *read* Barnes, James Burden.

Page 913, col. 2, line 28 from bottom, *for* Barnes, James Bunden, *read* Barnes, James Burden.

Our attention has also been called by Mr. Gostling to a misprint in the report of his remarks at the Council at its last meeting (before, p. 908), which evidently referred to the letter addressed by the Professors to the Medical Council on the 7th of November last.

Pharmaceutical Society of Ireland.

MEETING OF THE COUNCIL.

The monthly meeting of the Council of this Society was held on Wednesday, the 2nd inst., in the College of Physicians, Dublin, at three o'clock.

The chair was taken by Dr. Collins, and afterwards by the President, Professor Tichborne.

The other members of the Council present were:—Messrs. Allen, Brunker, Doran, Grindley, Hayes, Hodgson, Lester, Simpson, Wells and Dr. Montgomery.

Mr. Hugh Fennell, the Registrar, read the minutes of the last meeting, which were confirmed.

Mr. Fennell read a letter from Dr. Kaye, Q.C., Clerk to the Privy Council, stating that that Council had been advised that the amended resolution of the Society relative to the certificate to be required from candidates for the licence was not sufficiently explicit, and that the law officers of the Crown had drafted the following rule, which was forwarded for consideration and approval:—

"Resolution—

"Every candidate for the licence who has not previous to January 3, 1883, passed the Preliminary examination of this Society, or such examination as is accepted as equivalent thereto, shall be required to produce (*a*) A certificate signed by a pharmaceutical chemist or apothecary, keeping open shop, stating that such candidate has served a *bonâ fide* engagement for a term of four years, or for two or more lesser terms, amounting in all to four years, as apprentice or assistant, with and in the sole employment of such pharmaceutical chemist or apothecary, or of a firm of legally qualified pharmaceutical chemists or apothecaries, of which the aforesaid pharmaceutical chemist or apothecary is a member; or (*b*) In cases where such candidate has not served a four years' engagement as aforesaid, in the employment of one such pharmaceutical chemist or apothecary or firm as aforesaid, but has served two or more shorter engagements for terms amounting in all to four years as apprentice or assistant, with and in the sole employment for the time being of a succession of different pharmaceutical chemists or apothecaries or firms of legally qualified pharmaceutical chemists or apothecaries keeping open shop, then like certificates showing that the candidate has served for such shorter terms as aforesaid, each of which certificates is to be signed by the pharmaceutical chemist or apothecary in whose employment the term therein mentioned has been served, or in case of a firm, by a pharmaceutical chemist or apothecary, being a member of such firm at the time of the signing of such certificate. When by reason of the death of the pharmaceutical chemist or apothecary with whom any such term as aforesaid has been served, or where from any other cause it shall become impossible or inconvenient for the candidate to procure a certificate signed as aforesaid, it shall be lawful for the Society to accept in lieu thereof such evidence as it shall consider satisfactory, showing that the candidate has actually and *bonâ fide* served such term or terms as aforesaid."

Mr. Brunker: The resolution follows our view of the case, only that it is expressed in legal terms.

The President: If it embodies the spirit of our resolution we had better let them have it in their own phraseology.

Dr. Montgomery: I think it would be better to refer it to the Legal Committee to look over before we adopt it. There is no hurry about the matter. What is the object of having so many words in the resolution?

Mr. Brunker: To prevent candidates from wriggling through. The rule as we drafted it was too vague.

The President: I think the object is to tighten us down, to prevent our resolution from being used too much against the candidates. The Certificate Committee is the one to consider it.

On the motion of Dr. Montgomery, seconded by Mr. Allen, the draft resolution was referred to the Certificate Committee, with a request that they would consider and report on it.

A letter was received from Mr. Charles L. Peel, Clerk to the Privy Council of England, acknowledging the receipt of a memorial from the Council of the Society to Lord Carlingford, on the subject of the Medical Bill.

The letter was ordered to be marked "read."

The President brought under the notice of the Council a report of the Pharmacopœia Committee of the General Medical Council. That Committee appointed a Sub-Committee on the 1st of July, 1882; and that Sub-Committee had placed the task of preparing a new edition of the Pharmacopœia in the hands of Professors Redwood, Bentley and Attfield. These gentlemen were to receive a sum of £800, which was to include the cost of experiments, etc., and the work was to be carried through the press to the satisfaction of the General Medical Council. The Committee intended to apply to all medical authorities, pharmaceutical and chemical societies, and others that they thought were likely to furnish useful information, in order that the work might be made as complete as possible. This report was satisfactory in one sense, and unsatisfactory in another. It was satisfactory to know that the editing of the Pharmacopœia was to be in such excellent hands as those of the gentlemen named. Professor Redwood was a thoroughly practical man, Professor Attfield had been for many years associated with pharmaceutical education and he would endeavour to make the Pharmacopœia an educational work. As to Professor Bentley, from his position in the Pharmaceutical Society of England, he believed that he was an excellent man also. But the unsatisfactory part of the matter was that the work was exclusively in the hands of the officers of the Pharmaceutical Society of England and that the Irish Society was left out in the cold. Of course they could not help that. It was one of the fatalities of that Island. But it was one of those little things that made constitutional people think that there were grounds for the Home Rule cry. At any rate all those things appeared to tend towards a principle of centralization. They in Ireland had to physic the people according to the directions of their friends on the other side, who had the entire control of the matter.

Mr. Brunker: They propose three omissions from, and twenty-nine additions to, the Pharmacopœia.

The President: One objection to the matter being placed exclusively in their hands, is that they will make the Pharmacopœia according to the London practice. They will probably introduce a lot of footy things, because they are fashionable in London practice, and expunge important articles.

Dr. Montgomery: Are we in a position to make suggestions to them?

The President: We will have to wait until we are asked.

Dr. Montgomery: But even before we are asked?

The President: It would not be consistent with our dignity to do so after what has occurred. I know that Dr. Apjohn took a very prominent part in the preparation of the last Pharmacopœia, and spent an immensity of time upon it, and yet I think his services were hardly recognized.

Dr. Collins said he knew that the services of Dr. Apjohn in connection with the last Pharmacopœia were not sufficiently recognized.

The Registrar read a letter from Mr. T. S. Hance, dated from the "P. L. Surgery, Limerick," forwarding his subscription of £1 1s. to the Society, and asking whether the Society would consider his certificates of pharmacy in conformity with the requirements of the Act. The shop he kept was not a public place of business, but he had the sanction of the Local Government Board for taking apprentices, and his certificates were recognized by all the medical boards.

The President: Does he compound prescriptions for the public?

Mr. Wells: He does not. It is not a shop. He has merely the dispensary to the workhouse; and I know that he has taken pupils there for some years.

It was ordered that Mr. Hance should be informed that the regulations required that the certificate should be from a pharmaceutical chemist, or apothecary, *keeping open shop*. His certificate could not therefore be recognized.

A report of the Law Committee was adopted.

A report from the Examiner stated that 10 candidates had passed the Preliminary examination held on April 2.

The following candidates passed the examination for the licence, held on April 4 and 5, and were now registered as pharmaceutical chemists:—

John Robson, 26, Clare Street, Dublin.

John Starrett Shortt, 16, Strand Road, Derry.

Some financial business having been disposed of, the Council adjourned.

Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

The fourteenth general meeting of the above Association (the last of the session) was held at the Royal Institution, on Thursday, April 26, 1883, the President, Mr. Councillor Woodcock, in the chair.

The minutes of the last meeting were read and, with some corrections, confirmed.

The following donations were announced:—The *Pharmaceutical Journal*, from the Society; the *Canadian Pharmaceutical Journal*, from the Editor; and 'Suggestions for Students' Classes,' by Mr. H. B. Bare.

At the request of a member, the Chairman submitted the following question to the meeting:—"How can a stannic salt be detected qualitatively in the presence of a stannous?"

To this Mr. Davies replied that he found that nitrate of ammonium admirably answered this purpose, as it precipitated the stannic but not the stannous salt.

Dr. Symes presented a specimen of green ginger, or rather undried ginger, to the Association and made some remarks respecting it.

A discussion upon this subject took place in which several gentlemen took part.

Mr. Mason asked whether Mr. Davies or any other member could give the Association any information as to whether the effects of an explosion were produced equally in all directions or whether the lines of destruction were somewhat erratic. The question was raised in his mind by the effect produced by exploding a match under the foot.

Mr. Davies thought that the gases, except when diverted from their original direction by intervening objects, followed a tolerably regular course, although he would not say that they exerted their influence quite equally in all directions from the centre.

Mr. E. Davies, F.C.S., F.I.C., then delivered a short lecture upon—

The Influence of Suspended Matter on the Indications of the Hydrometer.

In a discussion on milk analysis four years ago a distinguished professor said that floating matter in a liquid, whether heavier or lighter, did not affect the specific gravity of the liquid as shown by the hydrometer. The statement was promptly challenged and abandoned; but as I find that it is still commonly believed, I have made some experiments to see if it could be readily demonstrated that suspended matter has an influence, and if, in fact, the specific gravity, as shown by the specific gravity bottle and by the hydrometer, was the same under these circumstances.

I found that the latter subject was undertaken by Mr. Siebold, in a short communication to the *Analyst*, in 1879, and therefore the quantitative experiments need not be repeated. He showed that precisely the same specific gravity is shown by the hydrometer or by weighing when calcium carbonate or magnesia was suspended in gum water.

My intention to-night is simply to demonstrate that suspended matter exerts an appreciable influence.

At first sight it would appear that suspended matter should have no influence. It forms no part of the liquid and does not break the continuity of the liquid. If the suspended matter has the same specific gravity as the liquid it will not affect the hydrometer at all, and as most suspended matter has the same or nearly the same specific gravity as the liquid in which it floats, the question does not often arise. On consideration it will be seen that if suspended matter is diffused evenly an influence must be exerted, the greater as the difference between the specific gravity of the liquid and that of the suspended matter is greater. For the reason that a hydrometer floats at any given mark is, that the part of the hydrometer which is immersed exactly displaces a bulk of liquid equal in weight to that of the entire hydrometer. That is, each cubic inch immersed displaces a cubic inch of liquid, and that cubic inch of liquid of course included the solid matter floating in it, and the weight of that cubic inch of liquid was the weight of the fluid and solid matters in that cubic inch taken together. It would be so if the solid matter were dissolved; it is equally so when it is merely suspended.

This is true whether the floating matter is lighter or heavier than the liquid. Hence skim milk is denser than fresh, both by the hydrometer and specific gravity bottle. The fat globules displace an equal bulk of the heavier milk, so that a smaller weight being contained in a given bulk a greater bulk of the hydrometer must be immersed in new milk than in skim.

The illustrations were:—First. A hydrometer was floated in pure water. Calcium carbonate was then diffused in the water and the hydrometer now had its stem entirely out of the liquid. Second. A small figure of glass weighted so as just to remain at the bottom of a vessel of water, rose to the surface when powdered glass was sprinkled into the water. Third. Gum water, of density 1·025, was rubbed with a little oil to make an imperfect emulsion; it now showed a density of 1·012.

An experiment previously made with starch showed that 2½ per cent. of starch in suspension in water raised the specific gravity to 1·010. An equal quantity of starch boiled with water and made to the same bulk gave precisely the same density.

This most interesting and valuable communication was illustrated by striking experiments, and was followed by a number of questions, to which Mr. Davies replied.

A hearty and unanimous vote of thanks was passed to Mr. Davies.

The President then read his—

VALEDICTORY ADDRESS.

It is an old and, like many such, a good custom for the person whom you have raised to the highest dignity attainable in our Association—the Presidential chair—to address, on the occasion of the last meeting of the season, some simple words of thanks for the ready and acceptable help he has received during the closing session; for the kind forbearance with which you have glossed over his many shortcomings; and, above all, for the valuable and instructive essays with which you have, often at great personal inconvenience, maintained the interest of the meetings, and the high character of this Association, during the winter that has gone.

It is especially difficult for myself adequately to express the deep sense of obligation, under which I rest, for the courteous and sympathizing kindness I have experienced from you during the period of severe illness that has, most unfortunately, interfered much with my fit performance of the duties appertaining to this high office. I am glad, however, that on all those occasions, during which I was unable to preside, you have secured for chairmen, former presidents who combine experience of the requirements of the position with a higher degree of efficiency than I could possibly lay claim to.

Since I had the honour, in my inaugural address in October last, of delivering a dissertation upon the pharmaceutical "events" of the year, the Council of the Society, which exercises jurisdiction in this country upon matters affecting the welfare of the profession, has drawn up and sent to Her Majesty's Privy Council, the draft of a Bill intended, by amending the faulty Act of 1868, to abolish some existing abuses, and make an onward stride in the direction of that pharmaceutical progress, which is now, as it was in the days of Jacob Bell—of glorious memory!—the keystone and watchword of British pharmacy.

The various provisions of the draft Bill have received full and ample discussion in other quarters, and it is unnecessary for me in this short valedictory address to criticize, or even describe, the character of its provisions. There is one of the clauses, however, of which, whilst willing for the general good to sink all petty differences of opinion, I must express my deep regret at seeing included. I allude to that second clause, which has received so much disapproving criticism from pharmacists in all parts of the country. The Editor of the *Pharmaceutical Journal*, writing last Saturday upon the subject, appears to imagine that misapprehension of the exact purport of the provision lies at the root of this hostile attitude; but I would venture, in all respect to assure him that chemists and druggists are not necessarily babes and sucklings. Dr. Paul asserts, in effect, that as unlicensed persons are at present permitted to retail certain poisons, which the clause in question is intended to affect, it would not be an injustice to pharmacists if some purely formal restrictions were placed upon their sale by persons possessing no knowledge of their properties; and again, that the articles in question are not such as should be entirely intrusted for retail distribution to chemists and druggists. Everybody knows, all pharmacists at any rate, that these poisons are not, and have never been, subjected to any regulations whatever, but our respected Editor forgets that it is the *principle* and not the mere facts to which we take exception; a principle which, in my humble opinion, has been propounded and, to the present time, acted upon from the very foundation of the Pharmaceutical Society. Chemists themselves were first educated; practitioners of medicine were then educated; public opinion was educated; and, finally, Parliament itself had been educated to the belief that *competent knowledge of dangerous drugs is a necessary and important qualification of the person who distributed them to the public*; and now, after forty years of up-hill, though fairly successful labour, we turn round and say, in effect, that it was all a mistake. Qualification is only necessary where grains and drachms, pennyworths and shillingworths are to be dispensed; but where gallons and sovereigns are in question, the sale may be intrusted, without any irksome precautions, to the huckster who defines tinct. camph. co. as "Paddy's got it," and the root of Exogonium Purga as "jollup." But, answer the promoters of the Bill, The Privy Council—Government—refuses to have anything to do with a measure entirely confining the sale of these acids to any class, even although it be a specially educated class. Well, what then? Our duty, as qualified pharmacists, lies very clear. Before stating what that duty is, it will be necessary for us to consider what is the *cause* of the present agitation for another Poison Bill. It is not nitric acid, nor sulphuric, nor hydrochloric, nor even carbolic acid that has raised this cry. *It is entirely the traffic in quack remedies.* Not a word has been said in Parliament, nor even, I believe, in the public press about these acids; it is only the unrestricted sale of scheduled poisons, under the protection of a Government stamp, that has excited the indignant demands for reform from, for instance, the member for Bridport. This brings us to our duty as pharmacists. Government has declared that restrictions must not be placed on these poisons. Very well; the responsibility does not rest with us; our conscience is clear. Draw up a Bill imposing all sorts of restrictions on the sale of these so-called "patent medicines;" include the various other proposals that are contained in the present draft; but do not make any mention whatever of poisonous articles or their regulation. If a lay Government, knowing little or nothing about poisons or their sale, feels sufficient confidence in its own abilities to undertake the task of legislating in that direction, it is welcome to try. Ministers may add the clause; but pharmacists, necessarily knowing far more about the subject than even eminent statesmen, should firmly and decidedly refuse to have anything to do with the proposal. It has been well said that if this Bill becomes an Act, the last poison has been added to part 2 of the present schedule. More; I should not be at all surprised if Parliament amalgamated *that* list with the newly proposed schedule of "Poisonous" articles; oxalic acid, for instance, having quite as large a general and, I may say, unpharmaceutical sale as carbolic.

With regard to the second opinion I have quoted from the editorial remarks in the Journal of last Saturday, there need very little be said. If carbolic and the other acids do not pertain to the proper sphere of pharmacy, neither do potassic cyanide (largely employed by workers in the noble metals), arsenic and corrosive sublimate (both used extensively in taxidermy), or that oxalic acid to which I have just referred. We must, in fact, cease talking about what *should properly* pertain to pharmacy, and think of what *does* belong to it, in England at present.

On this clause I have felt obliged to express freely my dissent from the view taken by our lawfully constituted legislators; but with all the remaining provisions of the draft Bill I am glad to say I heartily agree. I am sorry that the *Chemist and Druggist*, a journal which possesses a large amount of influence, should persist in the policy it has ever adopted of promoting disunion in the pharmaceutical body. Opposition to the Pharmaceutical Society, and above all to the Council of that Society, plainly lies at the root of the captious and irritating manner in which it refers to the "Bloomsbury Clauses" of this Bill. With all due respect to the Editor of the *Chemist and Druggist*, I would assure him that most of the old and nearly all of the new class of pharmacists consider these identical "Bloomsbury clauses" as, at least, equally important with any other portion of the Bill. Their aim—their noble and praiseworthy aim—is *union*, the consolidation of the whole heterogeneous collection of practitioners of pharmacy into a united body, holding the same title of "pharmaceutical chemist," and, it is to be hoped, by some future arrangement, of "Member of

the Pharmaceutical Society." For until the two are invariably united, we shall never be able to exercise that powerful influence our numbers and educational standing should command.

At this late hour, and after hearing the interesting paper with which Mr. Davies has favoured us, it would be unthoughtful on my part to detain you longer. I wish, however, to offer my sincere thanks to all the officers, members and associates who have so kindly contributed to the general success of our meetings by their presence and support; to the Vice-President, and other gentlemen, for the courtesy they have shown in occupying the chair during my absence; and last, though by no means least, to Messrs. Haddock, A. C. Abraham, Brown, Davies, Conroy, Farmer, A. H. Samuel, Cariss, Symes and A. H. Mason for the capital papers they have provided for our instruction during the session.

A vote of thanks, moved by Mr. T. Fell Abraham, seconded by Dr. Symes, to Mr. Woodcock for his very interesting address, was put to the meeting by Mr. A. H. Mason, who said that it was his privilege as Vice-President to put that motion and that he would at the same time propose that Mr. Woodcock be unanimously re-elected.

Mr. Woodcock, however objected to this, saying that the election must be by ballot, and, at the same time, asking that no members would vote for him as he could not possibly accept the honour again; his health would not permit of his giving more time to such work than he was called upon to devote to the proper performance of his many other public duties.

Several members having urged Mr. Woodcock, without effect, to re-consider his decision, a ballot was taken. The votes were found to have been given in equal numbers for Messrs. E. Davies and Joseph Woodcock. The latter, however, as President, gave his casting vote for Mr. Davies, who was declared duly elected.

Mr. Davies expressed his thanks for the honour that had been conferred upon him, which, however, placed him in an awkward position, his other duties and the state of his health combining to render him anxious for rest, whilst he was, on the other hand, desirous of doing everything in his power to further the interests of the Association.

The proceedings then terminated.

EDINBURGH CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

The twelfth meeting of the session, being the annual business meeting, was held on Thursday, April 12, in the Rooms of the North British Branch, Mr. Peter Boa, President, in the chair.

The minutes of last meeting having been read and confirmed, the Treasurer read the Financial Statement, after which the Secretary read the Annual Report.

The Report commenced with a reference to the highly satisfactory state of the finances of the Association. The income from annual subscriptions last year showed an increase of £1 18*s.* 10*d.* over the previous session; and this year there was a further increase of £1 8*s.* 6*d.* The Association therefore continued to make steady and satisfactory progress. The new scheme of apprentices' prizes, the open meetings, etc., have led to a considerable increase in the expenditure, but notwithstanding this the Committee have been enabled to carry forward a balance of £10 14*s.* 4½*d.* The Committee then drew attention to the gratifying increase in the membership of the Association, which had not been due so much to any special effort on the part of the executive, as to an extended interest in and appreciation of such an Association on the part of assistants and apprentices. In the previous year the membership had shown an increase of thirteen over the previous session; this year there was a further increase of fourteen. The membership last year was fifty-eight and this year seventy-two. The arrangement for having fortnightly instead of monthly meetings had been successfully continued during the present session, all the papers being contributed by members of the Association. As an evidence of the growing importance of the Association the Committee mention, that at the opening meeting of the present session the members had been honoured with the presence and cordial expressions of goodwill of the President and three prominent members of the Council of the North British Branch. Two open meetings had been held during the session; one in November and the other in January. Both were largely attended and seemed to be highly appreciated by the members generally. The attendance during the session again compared very favourably with the previous ones. One of the most important changes during the present session had been the institution of the new scheme of apprentices' prizes, which was unanimously resolved upon at a special meeting of the Association, held on May 18, 1882, and the Committee congratulated the Association on the success which attended the carrying out of the scheme. The examination papers were of a very high order. The Committee next recommended that the sum of one guinea be devoted, as formerly, to the Benevolent Fund of the Pharmaceutical Society. It also recorded its high appreciation of the important and valuable assistance invariably received from the Secretary to the North British Branch.

On the motion of Mr. A. L. Fraser, seconded by Mr. J. Low, the Financial Statement and Report, together with the recommendations, were unanimously adopted, and on the motion of Mr. J. B. Robertson, seconded by Mr. MacEwan, a vote of thanks to the retiring office bearers and Committee was heartily accorded.

The office bearers and Committee for next session were then elected as follows:—President, Mr. Claude F. Henry; Vice-President, Mr. W. S. Turnbull; Secretary, Mr. S. G. Crowden; Assistant Secretary, Mr. William Pirie; Treasurer, Mr. W. S. Adamson, and as members of Committee, Messrs. Duncan, Dunlop, Forret, Fowler, Fraser, Hendry, Robbie and Stephenson. An Apprentices' Prize Committee was also appointed, consisting of the President, Vice-President, Secretary, and Messrs. Boa, Hill and MacEwan.

The remaining business having been disposed of, the meeting was closed.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

A meeting of this Society was held on Thursday, May 3, Dr. W. H. Perkin, F.R.S., President, in the chair

The following certificates were read for the first time:—

G. S. Bowler, A. Esilman, C. T. Heycock, H. Heap, W. J. Livingstone.

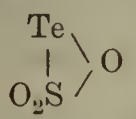
The Secretary then read a paper from Japan—

On a New Oxide of Tellurium. By E. Divers and M. Shimosé.—When the compound of sulphur trioxide and tellurium, SO_3Te, which was prepared almost simultaneously by R. Weber and the authors of the present paper, is heated *in vacuo*, it decomposes between 180° and 230°, evolving sulphur dioxide, and forming a new oxide of tellurium, TeO. This oxide can be prepared in small quantity by the action of water on the sulphoxide. The oxide is black in colour with a slight brown shade and shows, when pressed with a hard body, a graphitic lustre; it is quite stable in dry air at ordinary temperature. Potassium hydrate has but little action upon this substance, but it is readily decomposed by acids. No compound of TeO could be obtained; but the authors have specially compared this substance with a mixture of

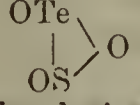
tellurium and tellurium dioxide and find that its behaviour with chemical reagents is quite distinct from the reactions of the mixture.

Two papers by the same authors were also read—

On Tellurium Sulphide.—The authors state that they had discovered this body before the arrival of the *Berichte* and the *Journal of the Chemical Society* which contained R. Weber's account of its formation. Their results are not, in some respects, quite in accord with those obtained by the above chemist. The tellurium was obtained from the mud in the lead chambers of the Imperial Japanese sulphuric acid works in Osaka. The liquid sulphur trioxide was poured on to the tellurium, both substances being contained in a sealed glass tube. The sulphur trioxide adhering to the sulphoxide was removed by heating the latter to 35° and exhausting with a Sprengel pump; a long tube packed with borax being interposed to absorb the trioxide. The sulphoxide is a red amorphous solid which softens without melting about 30°. It is vesicular in structure and, when pure, is quite stable, at ordinary temperatures, in sealed tubes. Details of its analysis are given. When this sulphoxide is heated to 90° in a vacuum its colour changes to a bright fawn colour, no gas is evolved, and its composition remains unaltered. The authors suggest for the red variety the cosnstitution—



and for the brown—



Similar modifications of selenium sulphoxide seem to exist.

On a New Reaction of Tellurium Compounds.—Sulphuric acid dissolves only small quantities of tellurium dioxide or its sulphate, but this solution furnishes a most delicate reaction for the presence of tellurium. By pouring some of it into a hydrogen apparatus containing zinc and dilute sulphuric acid and passing the escaping hydrogen telluride through a second portion of the telluretted sulphuric acid, the red colour of tellurium sulphoxide is rapidly developed in the previously colourless liquid.

$$2TeH_2 + TeO_2 + 3H_2SO_4 = 3SO_3Te + 5H_2O.$$

Dr. Williamson was strongly impressed with the care shown by the authors in this research and with the value of their results; the existence of this protoxide raised some interesting points bearing on theoretical questions. In the first place the evidence adduced by the authors of the difference between this oxide and a mixture of tellurium and dioxide seemed to him decisive in establishing its existence, but it was curious that the authors could not prepare any corresponding compound. Now, although it has generally been required that an oxide should have its corresponding chloride, etc., as a guarantee of its existence, yet it seemed that there was no reason why an oxide should not exist without a corresponding chloride, so that the non-discovery of the chloride must not be taken as a proof that the oxide did not exist.

The Secretary then read a paper—

On a Simple Modification of the Ordinary Method for Effecting the Combustion of Volatile Liquids in Glaser's Furnace with the Open Tube. By WATSON SMITH.—The author having observed that some of the students in the Chemical Laboratory of the Owens College were not able to make presentable analyses of a sample of chemically pure benzene when using Glaser's furnace, etc., devised this modification. The end of the combustion tube containing the liquid in a bulb is made to project from the furnace, beyond the liquid is inserted a plug of oxidized copper. This plug is warmed by a Bunsen burner, and thus the gas current is heated sufficiently to volatilize the liquid slowly and regularly. Two analyses of benzene and absolute ether are given, the results closely approximate to the theoretical numbers.

Mr. G. BEILBY then read a paper—

On the Production of Ammonia from the Nitrogen of Minerals.—In the present paper the author, who has worked at the distillation of coals and shales in connection with William Young for some years, gives the results obtained by distilling two shales, one a typical oil shale from Midlothian, the second a coal shale from Ayrshire. These shales were distilled (1) by the usual process of distilling at a low red heat; (2) at a low red heat in a current of steam; (3) at a low red heat in a current of steam, the residual coke being afterwards subjected to the prolonged action of steam at such a temperature that the whole or a large part of the carbon being consumed by the steam, the nitrogen is liberated as ammonia. The soda lime process was used for the determination of the nitrogen. The results are given in pounds of N per ton. No. 1 shale gave with the first process 2·70 pounds of N as NH_3 in the watery distillate and 1·20 pounds in the coke. The nitrogen combined with carbon amounted to 8·88 pounds in the coke. By using the second process, all the ammonia in the coke came over in the distillate, and 3·9 pounds of N as NH_3 were found in the watery distillate, the N combined with carbon remaining untouched. In the third process, however, the N as NH_3 in the watery distillate amounted to 12·0 pounds; the N combined amounted to only 0·78 pounds. Similar results were obtained with No. 2 shale. In the third process the carbon, steam and temperature should be so adjusted that the reaction is $C + 2H_2O = CO_2 + 2H_2$.

Mr. BEILBY also read a short paper—

On the Specific Gravity of Paraffin Wax, Solid, Liquid, and in Solution.—The specimen melted at 38° C. Its specific gravity solid at 21° C. was 0·874; when dissolved at 21° in heavy paraffin oil, 0·7956. By taking the specific gravity of fused samples at various temperatures and continuing the curve thus obtained, the specific gravity of fused paraffin at 21° would be ·796.

In reply to Dr. Armstrong the author stated that the above improved process (No. 3) of distillation was very successful commercially, the results being startling. In one case a coal shale which furnished only 18 pounds of ammonium sulphate per ton, now yielded from 75 to 98 pounds. The whole of the nitrogen could not be economically obtained; much difficulty was met with in the fusion of the ash. If the coke was valuable no one would dream of burning it away; the process was particularly useful with small and bad coal.

The Society then adjourned to May 17, when Captain Abney will deliver a lecture on "Photographic Action Studied Spectroscopically."

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of this Association was held on Thursday, April 26. Mr. R. H. Parker, Vice-President, in the chair.

Mr. T. S. Dymond read a paper upon the "Synthesis of Uric Acid."

The author gave an account of the synthesis of uric acid which had recently been made by Horbaczewski from glycocol and urea. Horbaczewski stated that when these substances were heated together to a temperature of 230° C. uric acid resulted, but had not in any way explained the nature of the decomposition which occurred. Mr. Dymond had made two experiments, closely following the directions given by Horbaczewski, but had failed to obtain any evidence of the formation of uric acid; but he was still working upon the subject, and hoped to communicate his results to the Association at a future meeting. In the meanwhile, the above experiments must not in any way be taken to indicate that uric acid is not formed in the above reaction, but only that the directions given by Horbaczewski are evidently insufficient. The paper in-

cluded a detailed account of previous work, showing the constitution of glycocol, hippuric and uric acids, specimens prepared by the author being exhibited.

A discussion followed the reading of the paper, in which the Chairman, Secretary, and other members took part.

A vote of thanks was passed to Mr. Dymond.

Mr. R. A. Cripps read a paper upon the "United States Pharmacopœia Process for the Estimation of Hydrocyanic Acid," which is printed upon page 917. In the discussion that followed, the Chairman, Secretary, Dr. Senier and Messrs. Greenish, Short and Taylor took part.

A vote of thanks was passed to Mr. Cripps.

The Reporter upon Pharmacology, Mr. H. G. Greenish, then made a Report upon "Convallaria majalis," which will be published in a future number of this Journal. A discussion followed the reading of the Report, in which the Chairman, Secretary, Dr. Senier and Messrs. Corder, Cripps, Crow, Elworthy, Hamilton and Ranken took part.

After the discussion had concluded,

The Chairman said that he had an announcement to make which he knew would be heard with extreme regret by all present, the death of their former Vice-President and Reporter, Mr. Charles Herbert Hutchinson. Mr. Parker had known Mr. Hutchinson since his student days at the School of Pharmacy, when they worked next to each other in the laboratories, and felt very much grieved at his premature death.

Dr. Senier then moved the following resolution:—"That the School of Pharmacy Students' Association hears with deep sorrow of the death of Mr. Charles Herbert Hutchinson, in whom the Association loses a former Vice-President and one of its most active and distinguished members, and that the members of the Association take this opportunity of expressing their sincere sympathy with the relatives of their late fellow worker."

Dr. Senier in moving the above resolution spoke in high terms of Mr. Hutchinson, whom he had known and admired since Mr. Hutchinson first became a student under him in the laboratories of the Pharmaceutical Society.

The Secretary (Mr. Dunstan), in seconding the resolution, referred to his high regard for Mr. Hutchinson's scientific and personal worth, and specially dwelt upon Mr. Hutchinson's connection with and exertions for the Association.

The resolution was supported with the same feeling by Messrs. A. J. G. Lowe, H. G. Greenish and F. W. Short, and upon being put to the meeting was carried unanimously.

The meeting then adjourned.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

The Professors and the Pharmacopœia.

Sir,—It appears from the report of the last Council meeting, as published in your Journal, that some remarks were made relating to our position in connection with the Pharmacopœia, which we think are not justified by the facts of the case; and as the general tendency of the discussion is calculated, through its publication, to create a prejudice to our serious injury, we beg to offer the following brief statement in reply.

The appointment of editor or editors is a preliminary step required to be taken by those who are responsible for the production of a work such as the Pharmacopœia, in the compilation of which information has to be obtained from many sources. One of us has occupied the position of editor in connection with the present Pharmacopœia, its additions and reprints, for the last eighteen years, during which time nothing has ever been said to indicate that he had done wrong in acccpting or retaining the office. On the present occasion when applied to with a view to the renewal of similar duties, seeing that there would be a large amount of new work to be performed, he wished to be relieved of part of the duties of the office, and, with that object, preferred to be associated with his colleagues in Bloomsbury Square rather than with any other persons. This arrangement was suggested and discussed in the latter part of last year, at which time the Medical Bill had not made its appearance, nor had any special attempt been made by the Pharmaceutical Council to obtain an alteration of the law which assigns to the Medical Council the duty of causing new editions of the Pharmacopœia to be published, when required, under their direction.

When application was made last August by the Sub-Committee of the Medical Council to their former editor for a renewal of his services, he suggested that a committee appointed by the Pharmaceutical Society would be of great assistance to the editors in collecting and preparing matter for the new edition, but he was informed that arrangements of that description must have the sanction of the Medical Council, which would not meet for several months. It was clearly understood, however, that medical and pharmaceutical authorities throughout the country would be invited to co-operate, as was done in producing previous editions of the work, with the view of making this edition as complete and perfect as possible.

We received our provisional appointments on the 12th of last January, but we were not at liberty to make public the arrangements then made, partly because they were only provisional, and partly because it was contemplated and thought desirable that the arrangements when confirmed by the Medical Council should be communicated by *that* body to the Council of the Pharmaceutical Society, together with the invitation for their co-operation in the work.

We regret that the announcement of the arrangements when completed have not yet been made by the Medical Council in the way that was anticipated, but we most emphatically deny that there has been any ground for the imputations made to our disparagement, nor do we consider that the interests of the Pharmaceutical Society have suffered or are likely to suffer from our action in this matter.

T. Redwood.
Robert Bentley.
John Attfield.

Sir,—I write to express my indignation with the action of the Professors in engaging themselves in the work of such a very important matter as a revision of the Pharmacopœia without consulting the Council.

Men of "light and leading" amongst pharmacists have been striving for a considerable period to have their claim to a share in the production of the national Pharmacopœia acknowledged, and that such action should have been taken by the Professors just when the goal was well in sight, suddenly placing the prospect under a blacker cloud than ever, is a very disheartening fact.

The question remains, What is to be done? At any rate I hope that the false steps already taken will be retrieved, as far as possible, by prompt action on the part of the Council.

Perhaps thorough discussion of the subject would discover a loop-hole from which to escape from the present embarrassing situation.

The Pharmacy,
Richmond, Yorks.

E. Bridges Walton, Ph.C.

Pharmacopœia Revision.

Sir,—In last week's article on Pharmacopœia revision, you refer to a proposed recognition of the fact, that absolute purity in chemicals is not attainable. It is, however, to be hoped that, whilst being protected from the excessive zeal of a too officious analyst, we may not be deprived of some standard to guide us in the examination of our drugs and chemicals.

As the tests of purity at present stand, it is impossible for anyone, however anxious, to get chemicals in all cases up to the British Pharmacopœia standard.

For example, under "Carbonate of Bismuth" we are told that when it is "added to sulphuric acid coloured with sulphate of indigo, the colour of the latter is not discharged." Can such carbonate of bismuth be prepared by the official process? I have not been able to find any such, the best out of several samples discharging the colour from ten times its weight of B.P. solution of sulphate of indigo.

Likewise under "Precipitated Carbonate of Lime," it is stated, that when dissolved in nitric acid, it produces no precipitate with nitrate of silver. But precipitated carbonate of lime, for which the best price is paid, generally contains from 0·1 to 0·4 per cent. of chlorides, and of course yields a very distinct precipitate when treated as described.

If, as in the above cases, traces of impurities are unavoidable, then recognize the fact and fix definitely the limit of such impurity.

Purified animal charcoal, we are informed, leaves on ignition "only a slight residue." Would it not be much better to state how much, say 5 or 7 per cent.? On examining a sample of this substance lately purchased, I found it left 74 per cent. ash, and returned it to the makers, stating it was "unpurified," and received in return another lot just as bad. Is 74 per cent. a slight residue?

By all means let us have a standard as high as is practically attainable, but let it be one that we may expect the manufacturers to adopt.

St. John's Wood. W. H. Symons.

The Draft Pharmacy Bill.

Sir,—The notice of motion which Mr. Sandford proposes submitting to the Annual Meeting is, I think, most desirable, but in order that the general feeling of the trade may be more fully represented than is possible at such meetings, would you allow me to suggest, through your pages, the desirability of provincial associations at once bringing the subject before their local members, and by resolution or otherwise forwarding an expression of opinion thereon to the President?

Belgrave House, West Brighton. Edwin B. Vizer.

Nigella sativa.

Sir,—The "Month" of April 28 contains a summary, in a few lines, of a recent investigation of the seeds of *Nigella sativa* by Pellacani. As these seeds have been the subject of more than one communication by myself to the *Pharmaceutical Journal*, I may be allowed to make a few observations on a point of some importance in Pellacani's research.

In the course of his paper the author alludes to the beautifully fluorescent solution yielded by the seeds and the steps taken to isolate the fluorescent substance itself.

Some time ago I drew attention in the columns of this Journal (vol. xii., p. 681) to the extensive substitution, especially in Germany, of the seeds of *Nigella damascena* for those of *N. sativa*. Amongst other characters of the former I especially noted the peculiarity that all the samples at my disposal yielded fluorescent solutions, and I stated that this was not the case with any sample of *N. sativa* I had examined.

It is, therefore, I think, more than probable that Pellacani's seeds were not those of *N. sativa* at all, but consisted, entirely or principally, of *N. damascena*. The latter may be recognized by their rounded form, the transverse furrows, and the fragrant odour of strawberries they exhale when crushed. Whether the seeds to which Dr. Canolle referred in the *Journal de Medicine*, Feb., 1882 (a paper, by the way, that I have been unable to trace) were identical with those examined by Pellacani still remains to be shown. And the latter will, I fear, have made but a slight addition to our knowledge unless he can satisfy us of the origin and freedom from impurity of the seeds he has worked upon.

H. G. Greenish.

Salicylic Acid for Corns.

Sir,—For nearly twelve months past I have made and used a mixture, similar to that described on p. 884 of the Journal, as a remedy for corns. I soon found it advantageous to employ a certain proportion of flexile collodion, and also to make the relation of the alcohol to ether somewhat higher, in order to obtain a satisfactory, adherent, and permanent film. Care, too, is requisite in making the mixture, or gelatinization ensues, in which condition the application is neither so easy to use nor so efficacious.

South Norwood, S.E. J. H. Baldock.

Syrup of the Phosphates and Potassium Chlorate.

Sir,—A conclusion one might draw from the letter of one of your correspondents is that potassium chlorate would have no reaction on a compound syrup of phosphates carefully prepared with pure phosphoric acid and free from HCl. I think, however, the following data will show that a reaction, quite as remarkable in another way as the one which has been under discussion, does take place.

A sample was prepared in the proportion mentioned by Mr. Prosser and allowed to stand four days; shortly after mixing, turbidity ensued, and at the end of the time mentioned a distinct precipitate had formed while the colour had gradually lightened. The precipitate collected on a filter and washed was found to consist of the phosphates of iron and calcium; the filtrate contained the phosphates of sodium and potassium with a trace of calcium and the colouring matter.

The reaction would probably be as follows:—

$$2\,KClO_3 + H_3PO_4 = K_2HPO_4 + 2\,HClO_3$$

The free phosphoric acid by which the phosphates were held in solution being decomposed, the insoluble phosphates of iron and calcium would be precipitated, the soluble ones of potassium and sodium remaining in solution; the action of the chloric acid formed being to gradually oxidize the colouring matter.

30, *Weston Road, Hove.* Ernest F. Salmon.

Royal Naval Reserve Dispensing.

Sir,—Could any reader of the Journal state whether it is usual for the Admiralty and other governmental branches to hand over their dispensing to medical men? The reason I ask is this. In our locality there is a Naval Reserve and Coast Guard station, and during the course of each year a considerable amount of medicine is consumed by the men on drill. This, however, is all supplied by the medical man who prescribes it, who is an M.D., and one of that, alas! numerous family of M.D.'s who consider it madness to send a recipe to a druggist.

We enquired at the Director-General, Admiralty, for the conditions on which the dispensing was undertaken, and asked, as registered dispensers, to be allowed to offer, but we were informed that the Director-General must "decline" to deprive the medical man of the dispensing.

Now, sir, here is a grievance, and in our opinion a very glaring one. If the executive of H.M.'s Government encourages dispensing by medical men, who, we may ask, will discourage it?

We trust you will give this note a place in the columns of the *Pharmaceutical Journal*, with the view of eliciting any suggestions and shedding some light on the subject.

Quærens.

D. B. Shearer.—See the *Pharm. Journ.* for Dec. 23 last, p. 510.

E. P. Reid.—We are unable to comply with your request.

W. B. Jevons.—Hardwich's 'Manual of Photographic Chemistry,' the ninth edition of which has been published recently by Messrs. Churchill.

Junior.—(1) Dip the bottles into warm water for about a minute after the pomade has cooled. (2) A colouring may be made by digesting gamboge in olive oil.

J. Knight.—The following is quoted in Cooley's Cyclopædia:—Blanched almonds, 2 oz.; rose water, 8 oz.; orange-flower water, 2 oz. Make an emulsion, strain, and add sal ammoniac., 1 dr.; simple tincture of benzoin, 2 dr.

B. J. Kent.—The prescription is probably a German one, and the artificial Carlsbad salt ordered is official in the German Pharmacopœia. A formula will be found in the present volume of this Journal, before, p. 26.

S. H.—The Pharmacopœia is the final authority upon the point in question.

Communications, Letters, etc., have been received from Messrs. Kingzett, Howard, Alcock, Presley, Rhei.

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"New York Medical Journal," *August* 1880,
Dr. F. Weir,
in Lecture delivered to the College of Physicians and Surgeons, New York.

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* HALTON, J. H.
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(*Continued on next column*).

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Pharmaceutical Society of Great Britain,

17, BLOOMSBURY SQUARE, LONDON.

ELIAS BREMRIDGE, Secretary and Registrar.

NOTICES.

ANNUAL GENERAL MEETING.

Notice is hereby given that the forty-second Annual General Meeting of the Members and Associates in Business of the Society will be held at 17, Bloomsbury Square, Middlesex, on Wednesday, the 23rd day of May, 1883, at eleven o'clock in the forenoon for twelve *precisely*, to receive the Report of the Council, and to elect the Council and Auditors for the ensuing year.

By Order of the Council,
ELIAS BREMRIDGE, *Secretary and Registrar*,
17, Bloomsbury Square.

NOTICE of motion to be proposed at the Annual General Meeting of the Pharmaceutical Society of Great Britain, on Wednesday, May 23rd, 1883, by

GEORGE W. SANDFORD.

"That in the opinion of this meeting certain provisions set forth in the proposed Bill to regulate the Sale of Poisons and alter and amend the Pharmacy Acts require alteration, especially clauses 4 and 5, which render retail vendors of Patent or Proprietary Medicines who have not and cannot have any control over the required labelling of such medicines liable to prosecution for insufficient labelling, for which offence the proprietors only should be and can be made responsible."

CONVERSAZIONE.

By permission of the Lords of the Committee of Council on Education, the Annual Conversazione of the Pharmaceutical Society will be held at the South Kensington Museum, on the evening of Wednesday, May 23rd, at eight o'clock.

Each Associate and Apprentice of the Society, and each Chemist and Druggist on the Register, may, on application to the Secretary, obtain a card of admission for himself.

A card of admission has been sent to each Member and Associate in Business of the Society, to admit *himself and a lady.*

N.B.—No person can be admitted *without a ticket.*

THE JACOB BELL MEMORIAL SCHOLARSHIP.*

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TWO SCHOLARSHIPS are offered annually, and come into operation at the commencement of the Session in October. Candidates for these Scholarships must be Apprentices or Students of the Pharmaceutical Society, under twenty-two years of age, and have passed not less, or been engaged not less, than three years in the pharmacy of a Registered Pharmaceutical Chemist or Chemist and Druggist.

Each Scholarship is of the annual value of thirty pounds, and is to be held for one year. In addition to the Endowment, the Council provide free Laboratory instruction and admission to the lectures to the holders of the Bell Scholarships; and books of the value of five pounds, given by Mr. T. H. Hills, are divided equally between them.

The examination for these Scholarships takes place on the first Tuesday in July. Candidates desiring to compete must send notice to the Secretary, accompanied by Certificates of age and testimonials from their previous Employers or Masters as to capability, industry, and general conduct, on or before the first day of June.

Further particulars can be had on applying to the Secretary, 17, Bloomsbury Square.

* A scholar is supposed to be *commencing* his studies, or at least to have made only that progress which may be reasonably looked for during an apprenticeship. The object of the examination is to ascertain that the candidate has such an amount of ability, and affords evidence of having made such use of it in the acquirement of elementary knowledge, as will justify the expectation of his proving a successful student who may do credit to the appointment, and become a useful and accomplished member of the pharmaceutical body.

Special Notice to Advertisers.—See page ii.

THE TWELFTH ANNUAL DINNER

OF THE

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AND THEIR FRIENDS

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Chemists & Druggists' Trade Association of Great Britain.

NOTICE OF ANNUAL GENERAL MEETING.

NOTICE IS HEREBY GIVEN, that the SEVENTH ANNUAL GENERAL MEETING of the Members of this Association will be held in the Banqueting Room of the INNS OF COURT HOTEL, LINCOLN'S INN FIELDS, LONDON, W.C., on Tuesday, May 22nd, 1883, at Twelve, noon, for half-past Twelve, for the transaction of the following business :—

To receive and consider the report of the Executive Committee, and the General Statement of the Funds of the Association.

To elect an Executive Committee and Officers for the ensuing year.

To discuss questions affecting the interests of the Trade.

W. F. HAYDON, *Secretary.*

OFFICE OF THE ASSOCIATION,
23, BURLINGTON CHAMBERS, NEW STREET,
BIRMINGHAM, *May* 11*th*, 1883.

NOTICE TO ADVERTISERS.

THE PHARMACEUTICAL JOURNAL of MAY 26 will contain—

The Report of the Annual Meeting of the Society.
The Result of the Election to the Council.
Notices of the Annual Dinner, Conversazione, &c.
The Report of the Annual Meeting of the Chemists and Druggists' Trade Association.

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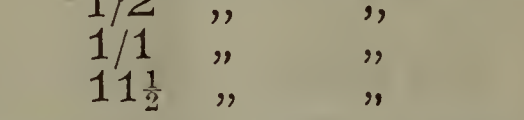

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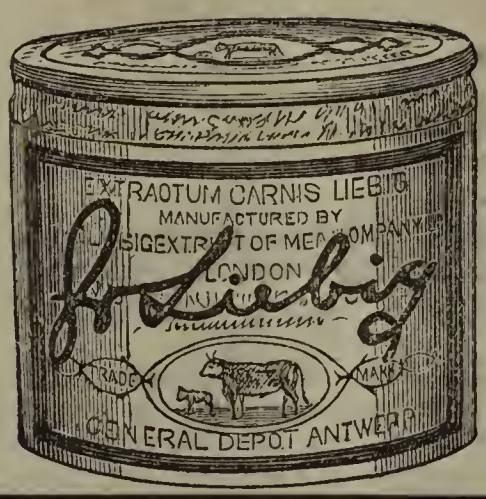

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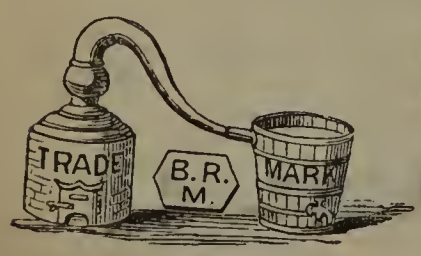

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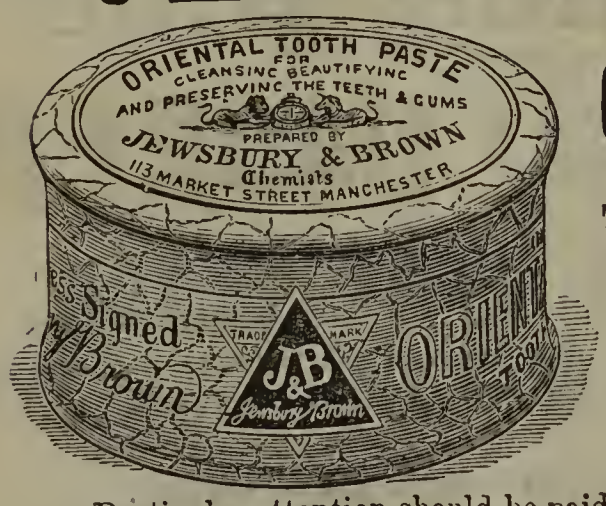

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SOME FACTS CONCERNING FILTRATION.

BY CHARLES SYMES.*

The process of percolation has engaged so much attention of late years that it is not surprising to find the less important although kindred one, filtration, somewhat neglected. It may be thought that all has been accomplished that could reasonably be desired for rendering this operation as complete as it can be, or that it is too simple to merit much consideration. Be this as it may, practical pharmacists know quite well that they are not unfrequently troubled to conduct it to their entire satisfaction.

The more serious difficulties connected therewith do not perhaps occur to each individual very often, hence the danger that the experience gained on one occasion is overlooked or not made available when circumstances again arise for its application.

The subject seems naturally to divide itself under three heads, viz.:—The liquid to be filtered, the medium through which it is to pass, and the form in which that medium is presented. As it is not intended, however, to make these notes exhaustive, it will be unnecessary to deal with it in precisely this order. Let us rather take some facts as they occur and see if we can by their consideration render available anything of practical value for every-day use.

The most simple operation of this kind is to filter through paper in small quantity a liquid containing a solid body for which it has no affinity.

Text-books tell us at the outset that it is very necessary to use a funnel the sides of which form an angle of 60°, this being the angle formed by the folded paper. Now I take exception to this very exacting requirement. We do not get our straining bags or percolators made of such a shape, and that because our experience teaches us how much more suitable is a form in which the angle is decidedly more acute; the same volume of liquid in this latter form producing a longer column, and consequently a greater downward pressure. Then, as to the paper fitting the funnel; we know quite well that all else being equal, the less perfectly it fits, the more rapidly filtration proceeds, so that, for any useful purpose it is quite unnecessary to insist on this very orthodox shape. One has, say, a pint of fluid to filter, and for this purpose a funnel of about 8 ozs. or 10 ozs. capacity is taken. I would use one of the long French pattern, fold the filter in plaits and before opening it out, place it fairly well down in its position in the funnel; or if there were reasons for not plaiting the filter, then it should be folded first in half, and then the two outer portions, representing rather more than one-eighth each of the entire paper, should be turned back so as to overlap each other slightly at the top, and not to form a very acute point. In either case, the paper whilst being fairly well supported would have comparatively little surface adhesion and but small resistance would be offered to the passage of the fluid in any part. Funnels of this shape in much larger sizes can be used with advantage, but it is then desirable to have them ribbed. The ribs of funnels (especially of large ones) to be of any real value should be much deeper than they usually are, and should not run vertically, but spirally. A piece of muslin placed between the paper and funnel not only strengthens and supports the paper, but assists filtration by preventing adhesion; a cone formed of coarse hair cloth is still better. For larger sizes, say of from 4 to 8 pints, it is advantageous to dispense with the funnel altogether, and to use an inverted cone formed of linen or stout calico; the edges being fastened to a wooden hoop, which, resting on a deep earthenware pan, forms an efficient support for the paper, the liquid passing through with equal facility over the entire surface, a suitable cover placed over it excluding the air, and the process goes on under comparatively satisfactory conditions. A self-feeding arrangement can be fitted to this, if it be so desired, in a very simple manner.

When, by exhausting the receiver, atmospheric pressure is brought to bear on the liquid in a funnel, then the latter should be of the *orthodox* shape, as with it air is less likely to pass; but this requirement militates against the advantages that such a method would otherwise possess. The point of the filter should be supported by a cone of platinum or zinc, or by a packing of tow or prepared wool.

English paper makers do not appear to have devoted much attention to the production of filters in any variety, and for this reason we derive our supplies chiefly from the continent. It is a well-known fact that holding almost any of the common filters up before a strong light they are seen to be perforated more or less with minute pinholes, so that when in use it is only after these have become filled up that the whole of the solid matter is separated, and the liquid passes through bright. Each time a fresh portion of liquid is added, the disturbance caused thereby is liable to remove some of the particles which are acting as a filling, and if this occurs filtration again becomes imperfect. These filters, although very cheap, do not pay to use if time and convenience are taken into consideration. There is, however, considerable difference in the efficiency of the various kinds of filtering papers, even when free from this defect. The presence of animal matter, as in the grey filter, increases the strength, but diminishes its working capabilities, and the existence of mineral matters therein does the latter but not the former. The papers specially prepared by Messrs. Schleicher and Schüll are practically free from all extraneous matters, the pulp having been treated with hydrochloric and hydrofluoric acids, etc. They are an example of what can be accomplished in this respect, but at the same time they are too expensive for general pharmaceutical purposes, and, indeed, are only made in comparatively small sizes suitable for analytical work. For operations requiring filters of 7 inches diameter (before folding), the Rhenish papers, No. 595, are, in my opinion, the most suitable; for larger sizes the French stout plaited or plain papers, taken in all their qualities, give the best results. The French also make a paper specially suitable for syrups, thick to support the weight, and yet sufficiently pervious to allow of fairly rapid filtration. I find, however, in very large sizes, a double sheet of Rhenish paper in an inverted case of linen, as already described, answers even better.

Some fabrics, such as swansdown, close textured twilled calico, etc., filter as brightly as paper does, and may be used for that purpose as distinct from ordinary straining, provided the solid particles separate from the liquid in which they are suspended with ease, but when this is not the case they are of much less value; indeed, with paper as a medium, slimy

* Read before the Liverpool Chemists' Association.

deposits present considerable difficulty. Pepsine wine, prepared from the fresh, undried pepsine, might be regarded as typical of this class of liquids; the tendency being to choke up the pores of the filter almost immediately the operation commences. In such cases some kind of coarse straining material placed within the paper cone helps materially to obviate the difficulty. Hair cloth and thin coarse flannel answer well for this purpose; they operate by collecting on their rough projecting surfaces the larger proportion of the undissolved slimy matter, without becoming sufficiently choked up to materially impede the progress of the operation.

Succus taraxaci, as expressed from the root and mixed with spirit according to the B.P. instructions, is typical of a class containing a large quantity of starchy matter and where subsidence in a closed vessel previous to filtration is of great service. The liquor from poppy capsules, in the process of preparing syrupus papaveris alb., furnishes us with an example of a liquid containing a large quantity of albuminous matter and mucilage which, when coagulated by spirit, has to be filtered off, and here again subsidence in a closed vessel helps the separation materially. The greater portion of the liquor can, after a time, be poured almost bright into the filter, and the remaining soft mass can with care be slowly pressed almost dry; the chief difficulty in this latter operation being to press sufficiently slowly to separate the liquid from the solid, and yet not to expose it to the air long enough to lose much spirit by evaporation, as in that case some of the solid portion would be again taken up in imperfect solution.

For removing suspended particles from strong acids, spun glass, known as 'glass wool,' answers best, but this might be regarded as straining rather than filtration. With ordinary liquids, when there is but little insoluble matter, absorbent cotton not only strains, but by fairly tight packing filters brightly. In cases where it is desired to save the deposit, and possibly to dry or incinerate it, asbestos paper can be recommended; the liquid passes through it slowly, but it is very strong, and it is indestructible by heat. Paper lint, as introduced from America some few years ago, answered well as a filtering medium, being both strong and absorbent; but I am not certain whether its manufacture has been continued.

So far we have considered filtration as conducted only in funnels or funnel-shaped arrangements, as the various forms in which atmospheric pressure is commonly employed are described in works which treat of such matters. They are chiefly those in which a long column of liquid is carried above the point of filtration, as in Mr. Proctor's arrangement; where exhaustion is obtained by means of a syringe underneath; or suction by means of a bent tube, as described by Mr. Schacht at the meeting of the Conference at Birmingham in 1865. Recently there has been advertised a "Filtre Rapide," in which the filtering material is placed on a frame or support rising up within the cylinder and forming a space in the centre into which the filtered liquid flows laterally to a receiver below. It is a compact and ingenious arrangement, but I have not any experience from which to speak of its usefulness.

To my mind upward filtration is the direction in which we should work, and from which we may expect the best results.

Some years ago Mr. William R. Warner, of Philadelphia, invented an oil filter on this principle, consisting of two vessels in superposition, measuring altogether about 40 inches in height by 10 inches in diameter, and which is said to be capable of filtering a barrel of oil per day. This of course would depend on the nature of the oil and the temperature at which it is used.

Recently I have devised a form of upward filter in one vessel only, and have added to it a suction tube. It occupies comparatively little space, is simple in construction, efficient in action, and can be made by any tinman at little cost.

It consists of a plain tin cylindrical vessel (A) with a tap-hole (B) 1½ inch from the bottom; it is 22 inches high and 8 inches diameter. A tin tray (C and fig. 2), 7 inches in diameter, with a vertical rim 1 inch or 1¼ inch deep, has a hole (B′) in the rim; this and the hole near the bottom of the cylinder being fitted with a short

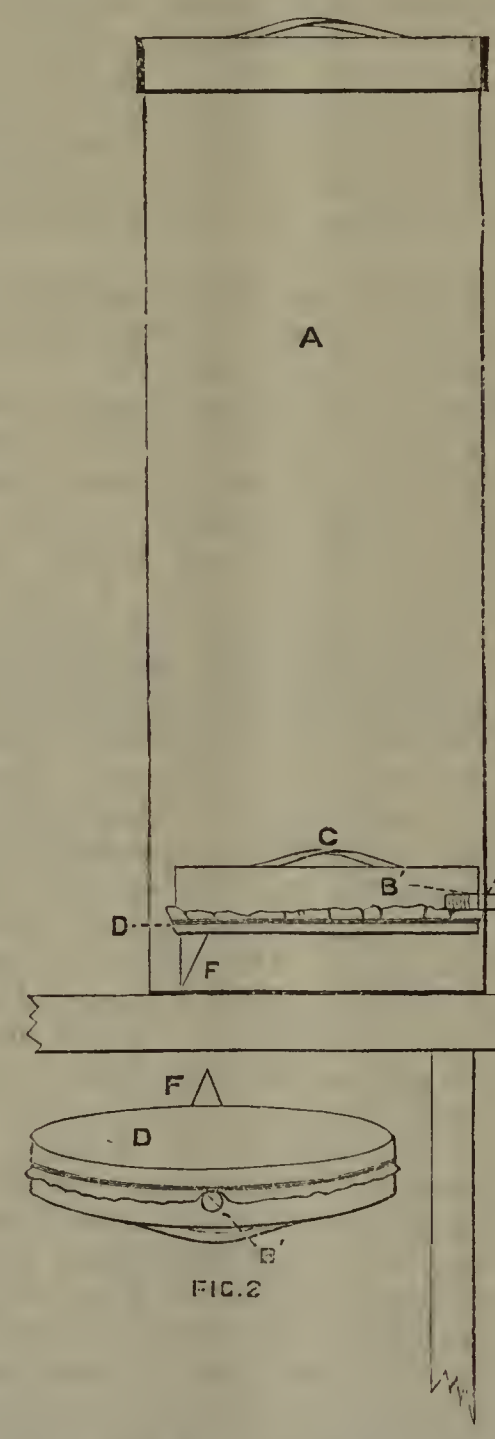

FIG. 1

FIG. 2

female screw of the same pitch of thread. Over the tray the filtering material (D) (flannel, calico, paper supported by muslin, or any other that may be suited to the liquid to be operated on) is tied securely; it is then inverted and placed in the cylinder so that the holes B and B′ are exactly opposite one other. A tap (E) with a bend at a right angle is screwed in so that it holds the two together and assists a short leg (F) in supporting the tray in position. To the end of the tap is attached an india-rubber tube turned on itself (G), or a long glass tube

of similar construction (in fact like a large safety funnel deprived of the thistle head), which can be attached by a short piece of rubber tube. It will be obvious that any communication between the tap and the contents of the vessel must be made through the filtering medium which covers the inverted tray and that any deposition which takes place must be on the bottom of the vessel itself or on the opposite side of the tray, but not on the filtering surface, and herein lies the special advantages of the filter I now introduce. The use of a long delivery tube is not new; it formed part of an oil filter patented by Mr. Britten, of Liverpool, some years before Mr. Schacht's application of it to his filter. Neither is upward filtration new, as already stated; but the combination of the two and in this particular form will, I believe, commend itself to anyone who will give it a trial.

The dimensions given furnish a filter of about 3 gallons capacity at a cost of some ten or twelve shillings.

COLOURED INSECT POWDER.

BY W. L. HOWIE, PH.C., F.C.S.

Mr. Conroy has done good service in calling the attention of the trade to the adulteration of insect powder in the paper read before the Liverpool Chemists, Association and published in a recent Journal.* I have been working on the same subject for some time past, and as my experience and results differ from Mr. Conroy's, I think it well, without further delay, to throw my notes into form for publication.

The adulterant mentioned in the report of the Liverpool meeting as having been found by Mr. Conroy is fustic, which is one I have not met with although particularly looked for. I have not yet, however, hit upon a satisfactory method by which one can readily detect small proportions of this substance, as well as other yellow dye stuffs, which I have reason to suspect are used to "reduce" the powder. I have found microscopical examination unreliable, artificially coloured insect powders, to my knowledge, being passed as genuine even by a skilled microscopist, and I have found comparison with test samples prepared by blending various pigments with genuine powder in a mortar very misleading, as little difficulty is then experienced in detecting the specks of the colouring ingredient, but in the commercial powders the pigment is without doubt added during the grinding process, and if well selected, becomes so incorporated with the vegetable tissue as to escape any but an experienced eye, even when aided with the polariscope. I have, therefore, not relied upon the microscope as far as my investigation has proceeded, finding chemical method more exact and trustworthy.

I have examined about twenty samples, none of which was supplied to me specially for examination, but purchased in packets, or obtained as *bonâ fide* samples offered by wholesale dealers to retailers in the ordinary way of business. With the exception of No. 3 following, all are powders from well-known firms, most of whom claim to be grinders. Selecting twelve as typical, both as to source and general character, I placed them side by side and arranged them according to their depth of yellow colour, with the following result:—

Vendor's Definition.	Colour.	Adulterant.
No.		
1. "Insect Powder" .	Drab . . .	Genuine.
2. " " .	" . . .	"
3.	Olive drab .	"
4. "From closed Flowers" . . .	Yellowish . .	"
5. "All closed Flowers" . . .	" . .	"
6. "Open Flowers" .	" . .	"
7. Packet Powder . .	Yellow . .	Chrome.
8. " " . .	" . .	"
9. "Opt"	" . .	"
10. "All closed Flowers" . . .	" . .	Turmeric and chrome.
11. "Foreign" . . .	" . .	Chrome.
12. "Dalmatian" . .	Very yellow .	Turmeric.

After arranging the powders in this manner by the eye, it was apparent that between the colours of 6 and 7 there was a preceptible gap, and when by testing it was proved that Nos. 7 to 12 were artificially coloured, it will be seen that appearance is some indication of genuineness.

For further examination I discarded the first suggested plan of igniting the powder with potassium nitrate and testing the residue, and prefer what I think a more delicate and easy, if somewhat crude method. Incinerate say 20 grains of the suspected powder on platinum foil and carefully weigh the ash as well as note its character. For example, take No. 3, which had been reduced to powder in a mortar by myself from authenticated flowers. The ash was grey in colour and weighed 1·2 grain. This is placed in a test-tube, and a few drops of strong hydrochloric acid added, which causes some effervescence; heat is then applied to dissolve the ash, which consists chiefly of potash salts. The solution is colourless and the addition of a little water prepares it for the application of the usual tests.

Sulphuretted hydrogen gives no precipitate nor potassium iodide a yellow colour nor precipitate; but it ought to be here noted that ammonium sulphide and potassium ferrocyanide give the characteristic reactions indicating iron, which I found in small quantity in the ash of the genuine flowers, as well as in all the powders. This metal seems to exist in greater abundance in the florets, and in much less proportion in the seeds, and the indications of iron must be noted, as I have found two powders containing it in such quantity as to suggest that some ferruginous earth, such as ochre, had been used to make weight or colour. One of these powders is a proprietary article, and the other a small odd sample, which I cannot replace, therefore neither appears amongst the selected twelve.

The behaviour of a powder coloured with the usual adulterant, viz., yellow chrome, is quite different. The ash is brownish, or showing brown patches at the most exposed parts and the weight is greater; thus No. 7 yielded 2·1 grains. There is the same effervescence with HCl; but part is insoluble and the solution on heating becomes distinctly green, which with a black precipitate with H_2S may be taken as conclusive proof of the presence of lead chromate. KI gives a yellow colour, and if the HCl be not in excess a yellow crystalline precipitate separates.

Any attempt to judge of the amount of added chrome by estimation of the lead present I found

* *See* before, p. 869.

futile, which is readily understood when it is remembered that the finer chromes are said to be "struck" on magnesia, and undoubtedly the alkaline earths are found to bulk largely in the composition of many.

No. 12, although of a strikingly deep yellow colour, gave only 1·2 grain of grey ash, and thus suggested that some vegetable colouring had been used, and on the sample being tested by the method devised by myself for the detection of artificial colouring in rhubarb and other powders (*Pharm. Journ.*, [3], vol. iv., 354) the supposition proved to be correct.

Pieces of white blotting paper corresponding to the number of samples are taken and named or numbered, and a few grains of the suspected powder placed in the centre and pressed compactly down with a piece of paper or a spatula. Chloroform (or other menstruum) is then carefully dropped from a pipette on the centre of the powder till it has moistened all and extended some distance beyond the powder. The paper is then allowed to dry, wiped free of the powder, and the stain if any, tested by suitable reagents.

Treated in this manner the genuine powder yields a slight yellow colour to the paper; but No. 12, and in less degree No. 10, gave a very distinct stain, which an atom of boracic acid and a drop of HCl at once identified as due to turmeric. The stain from genuine powder becomes bluish green with nitric acid, brownish with sulphuric, and only exhibits a slight darkening with potash solution. The turmeric stain becomes reddish brown with nitric acid, dark brown with sulphuric acid or potash. Fustic seems to yield nothing to chloroform, but a yellow stain obtained with alcohol becomes a distinct brown with nitric acid and shows little change with sulphuric acid or potash. Solution of a ferric salt strikes a bluish black both with the fustic and pyrethrum stain obtained with alcohol.

When fustic is boiled for some time in water with zinc and sulphuric acid, the solution gradually assumes a bright red colour owing to the transformation of one of the colouring principles, morintannic acid, into phloro-glucine and machromine.

The flowers of *Pyrethrum cinerariæfolium* treated in the same fashion show no change, but I have been unable to get this very promising reaction to indicate distinctly anything under 20 per cent. of fustic in insect powder, although I am hopeful that an improved method may yet result in greater delicacy.

No.	Percentage of ash.	No.	Percentage of ash.
1	6·2	7	10·5
2	7·1	8	9·6
3	6·	9	9·2
4	6·8	10	8·0
5	6·2	11	9·4
6	6·2	12	6·0

The above table shows the percentage of ash yielded by the twelve samples, and comparing that with the names given by the vendors little relation will be observed between them. From more exact analysis I take the first six to be genuine powders, with the exception of No. 6 which has a suspicion of some dye wood, which I have not yet identified, attached to it. Numbers 7 to 11 are adulterated with chrome from 3 per cent. to nearly 6 per cent. No. 10 has the addition of a very small percentage of turmeric, and No. 12 quite 5 per cent. of that root. It is not to be assumed that excepting these slight admixtures these powders are genuine; for although undoubtedly it is bad enough when having ordered a hundredweight of insect powder one finds 5 to 7 pounds of chrome yellow, costing 4*d.* to 10*d.* per pound, as part of the delivery, the presence of such extraneous colour is suggestive of its being merely a cloak for a more weighty adulteration, such as Mr. Conroy has discovered, or as that referred to by Mr. E. V. Riley (*Pharm. Journ.*, [3], vol. xii., 789), who says that "the stalks and leaves are ground with the flowers in the proportion of one-third of their weight;" whilst on the authority H. Kalbruner (*Pharm. Journ.*, [3], vol. v., 305), "The plant itself (minus the flowers) powdered appears to be quite inactive."

In face of the foregoing facts it seems advisable that purchasers should avoid the foreign powder, which seems to be always coloured, and not too trustingly accept any guarantee, even of professed grinders, but verify for themselves each purchase, which by the means above stated can readily be done in a few minutes even by a junior assistant.

NOTE ON VORTMANN'S METHOD FOR THE SEPARATION OF CHLORIDES, BROMIDES AND IODIDES.*

BY J. B. BARNES, JUN.

In 1880, G. Vortmann (*Ber.*, xiii., 325–326) proposed a process for the detection and estimation of chlorine in the presence of iodine and bromine. The method was based on the different action of manganese dioxide and lead dioxide towards the halogen elements. The author stated that iodides are decomposed by either of the oxides even in a neutral solution, and that the separation of iodine is complete if the liquid be boiled with acetic acid. Bromides are not decomposed by either oxide in a neutral solution; but in the presence of acetic acid, lead dioxide causes the separation of bromine, while manganese dioxide has no action. Chlorides, on the other hand, are not affected by either oxide in neutral or acid solutions. Chlorine is detected in the presence of the other halogen elements by boiling the substance with lead dioxide and acetic acid until the liquid becomes colourless and ceases to smell of iodine or bromine. Any lead iodate that may have been formed is separated by filtration together with excess of oxide used; the filtrate contains all the chlorine free from bromine and iodine. When chlorine is present with a large quantity of iodine, the use of manganese dioxide is to be preferred, to avoid the formation of the difficultly soluble lead chloride, and when there is a large quantity of chlorine in the presence of bromine, potassium sulphate should be added so that the chlorine may exist as a potassium salt.

The above process has been examined by C. L. Müller and G. Kircher (*Ber.*, xv., 812–813), who stated that they found chlorides to be decomposed by lead dioxide and acetic acid with liberation of chlorine and formation of mono-chloracetic acid, which is partially oxidized to carbonic anhydride, lead chloride being formed at the same time. When manganese dioxide was used no chlorine was liberated, but carbonic anhydride and manganese chloride formed. The action of lead dioxide and acetic acid on bromides and iodides was confirmed, but manganese dioxide and acetic acid were said to act alike on iodides and bromides. Both oxides acted slowly on iodides and bromides in neutral solutions, but neither had any action on chlorides.

Vortmann replied to this in a short paper (*Ber.*, xv., 1106), in which he stated that potassium chloride is not decomposed by lead dioxide when evaporated with a 2 to 3 per cent. solution of acetic acid, even when the

* A paper read before the School of Pharmacy Students' Association, March 29, 1883.

evaporation is repeated five or six times, whilst potassium iodide when similarly treated is readily decomposed, and potassium bromide, although with greater difficulty, is completely decomposed on repeated evaporation. Potassium chloride is decomposed with difficulty by the use of 5 per cent. acetic acid. Again, manganese dioxide with 2 to 3 per cent. acetic acid readily decomposes potassium iodide, but has no action on potassium bromide. With 10 per cent. acid only traces of bromine are liberated.

Since the publication of his last paper Vortmann (*Monatsh. Chem.*, iii., 510–530) has given detailed methods for the estimation of chlorides, bromides and iodides, by his process, of which the following is a brief *résumé*.

Estimation of Chlorine in Presence of Bromine.—The mixture of chloride and bromide is evaporated two or three times over a water-bath with lead dioxide and acetic acid 2 to 3 per cent. Bromine is evolved, the residue is treated with water, sulphuretted hydrogen passed to precipitate lead, solution filtered, and chlorine estimated by precipitation with silver nitrate.

Estimation of Chlorine in Presence of Iodine.—This may also be effected by the same method, or by using manganese dioxide in the place of lead dioxide. The latter method is preferable.

Estimation of Bromine in Presence of Iodine.—This estimation is easily effected by evaporating the mixture of iodide and bromide with manganese dioxide and dilute acetic acid several times over a water-bath.

Estimation of Chlorine in Presence of Iodine and Bromine.—Two processes are given. 1st. The mixture is boiled down several times with lead dioxide and dilute acetic acid, the lead dioxide being added to the mixed acidified solutions when in a state of ebullition, to prevent the formation of iodic acid, produced by the mutual action of the iodine on the bromine. The lead is then separated by sulphuretted hydrogen, and chlorine estimated in the usual manner. 2nd. The mixture is heated with manganese dioxide and dilute acetic acid till all the iodine is evolved, lead dioxide is now added and the boiling continued till the expulsion of bromine is effected; the filtrate, after separation of lead, is then employed for the estimation of chlorine. The latter process is said to give more exact results, as the iodine and bromine are expelled without the formation of oxy-acids. The author remarks that he has obtained satisfactory estimations of chlorine in the presence of iodine and bromine, when relatively large quantities of chlorine are present, but when much bromine is present the results came out rather too high. The estimation of iodine in the presence of bromine and chlorine gave good results; while that of bromine is at present unsatisfactory.

The experiments recorded in the following note had for their object the testing of the process as one for use in qualitative analysis.

(1.) 10 c.c. of a 5 per cent. solution of potassium iodide were mixed with 10 c.c. of 3 per cent. acetic acid and excess of lead dioxide, and evaporated nearly to dryness with constant stirring in a porcelain dish over a gas flame. The vapour of iodine was evolved. 10 c.c. more of acetic acid the same strength were added, evaporation and stirring being continued as before. This was repeated a third and fourth time. During the third experiment iodine was still evolved. The residue after the fourth evaporation was then treated with water, filtered, lead separated with dilute sulphuric acid, and again filtered. Potassium nitrite gave no coloration to the filtered liquid and silver nitrate produced only a slight turbidity.

(2.) In this experiment the same quantities of the solution of potassium iodide and acetic acid were taken, but manganese dioxide substituted for lead dioxide. The process was similar to the first experiment. Potassium nitrite imparted only a slight brown colour to the acidified solution, and silver nitrate gave a slight turbidity.

The inference to be drawn from these experiments is that iodine is practically wholly expelled from a solution of an iodide by lead dioxide or manganese dioxide in the presence of 3 per cent. acetic acid.

(3.) In this experiment, three separate portions of a 5 per cent. solution of potassium bromide were boiled with manganese dioxide and acetic acid of various strengths. The strengths used were 3 per cent., 33 per cent. and about 60 per cent. Paper moistened with solution of potassium iodide and starch paste was held over each dish. The third solution, in which the strongest acid was used, was the only one from which bromine was evolved.

This explains the apparent conflict between the result of Vortmann's experiments and those of Müller and Kircher; for while the former employed 2 to 3 per cent. acetic acid the latter used 50 per cent.

(4.) Here 10 c.c. of a 5 per cent. solution of potassium bromide, 40 c.c. of acetic acid (33 per cent.), and excess of lead dioxide were taken and treated in the same manner as in the first experiment, using 10 c.c. of the acid after each evaporation. After separation of lead, chloroform when shaken with a portion of the solution and a few drops of chlorine water was not coloured. Silver nitrate gave a slight turbidity.

(5.) The last experiment was repeated, but 3 per cent. acetic acid substituted for the stronger. After separation of lead, chlorine water and chloroform were added and the liquid shaken; a distinct red colour was imparted to the chloroform, silver nitrate gave a fair amount of a yellowish white precipitate, insoluble in nitric acid, sparingly soluble in ammonia; proving that 3 per cent. acetic acid and lead dioxide were incapable of removing all the bromine from the solution, even after four evaporations; while stronger acetic acid practically removed it all under similar circumstances.

(6.) In this experiment 10 c.c. of a 5 per cent. solution of sodium chloride, 40 c.c. of strong acetic acid, and excess of lead dioxide were taken and treated in the same manner as in the first experiment. After the fourth evaporation and separation of lead, silver nitrate gave a copious white precipitate, insoluble in nitric acid, soluble in ammonia; proving that the chloride was slightly or not at all affected.

(7.) In this experiment, 5 c.c. each of the 5 per cent. solutions of potassium iodide and potassium bromide, 40 c.c. of acetic acid (33 per cent.) and excess of lead dioxide were taken and treated as before, but the acidified solutions were first boiled and the lead dioxide added, little by little, whilst in a state of ebullition. After the fourth evaporation and separation of lead, potassium nitrite gave no coloration, chloroform when shaken with another portion of the solution and a few drops of chlorine water was not coloured, and silver nitrate gave only a slight turbidity; proving that both iodine and bromine were wholly removed. If lead dioxide be added to the cold acidified solutions and heat subsequently applied, the mass, as it approaches dryness, changes from brown to yellow, accompanied by rather violent action; on further heating it blackens and chars, and finally assumes a yellowish red colour, due doubtless to the formation of litharge. The residue when treated with water yields a coloured liquid which contains no lead but a large quantity of iodine. Vortmann notices this action and indicates as its cause the formation of oxy-acids of iodine.

(8.) In this experiment 3·3 c.c. each of the 5 per cent. solutions of potassium iodide, potassium bromide and sodium chloride, together with 40 c.c. of acetic acid (33 per cent.) and excess of lead dioxide were taken. The evaporation was carried on as in the other cases, using 10 c.c. of acid each time and lead dioxide being added to the boiling solutions. After the fourth evaporation and separation of lead, the filtrate gave no coloration with potassium nitrite, chloroform when shaken with another portion of the solution and a few drops of chlorine water was not coloured, while silver nitrate gave a copious white precipitate insoluble in nitric acid, soluble in am-

monia, proving that all the iodine and bromine had been removed, but that chlorine still remained.

(9.) In this the samc quantities of the three solutions were taken and the experiment conducted as in No. 8, except that the iodine was first expelled by manganese dioxide. A small portion of the mass was then tested, and bromine and chlorine found to be present. Lead dioxide was added and evaporation continued with acetic acid till bromine was expelled. Water was added to the mass as before, the liquid filtered, lead separated by sulphuric acid, again filtered, and silver nitrate added, which gave a copious white precipitate insoluble in nitric acid, soluble in ammonia.

From these experiments it will be seen that bromine cannot be removed from a solution of a bromide by using 3 per cent. acetic acid and lead dioxide, although by using a stronger acid this may bc effected.

There is one disadvantage in using manganese dioxide, namely, the tendency the solution has to spurt whilst evaporating, which necessitates incessant stirring; this makes the use of lead dioxide more advantageous where the isolation of iodine and bromine is not required. The primary reactions in the above process may be shown thus:—

$$2KI + 4HC_2H_3O_2 + PbO_2 = I_2 + 2KC_2H_3O_2 + Pb2C_2H_3O_2 + 2H_2O,$$

$$2KBr + 4HC_2H_3O_2 + PbO_2 = Br_2 + 2KC_2H_3O_2 + Pb_2C_2H_3O_2 + 2H_2O.$$

$$2KI + 4HC_2H_3O_2 + MnO_2 = I_2 + 2KC_2H_3O_2 + Mn2C_2H_3O_2 + 2H_2O.$$

The results of these experiments indicate that the following modification of the process might be used with advantage in many cases where a solution has to be analysed for any or all of the halogen elements. Add ordinary acetic acid (33 per cent.) to the solution, boil in an open dish, add a few grains of manganese dioxide; if iodine be present the liquid will instantly turn brown. More manganese dioxide must then be added, and the whole briskly boiled till a glass rod moistened with starch paste and held over the dish ceases to be coloured blue, showing that all iodine has been removed. If no coloration be produced when manganese dioxide is added, the solution may be at once tested for bromine After the separation of iodine treat the residue with water and test a portion for bromine. If it be present add lead dioxide and continue the ebullition with acetic acid till a glass rod moistened with solution of potassium iodide and starch paste and held over the dish ceases to be coloured blue, indicating that all bromine has been removed. Treat the residue with water, filter, separate the lead with dilute sulphuric acid or sulphuretted hydrogen and test the clear filtrate for chlorine with silver nitrate.

In conclusion, I have to thank our Secretary, Mr. Dunstan, both for suggesting this process as a subject for a paper and also for the valuable aid he has given me in working it out.

THE ACTIVE PRINCIPLE OF THE ROOT OF APOCYNUM CANNABINUM.*

BY O. SCHMIEDEBERG.

Husemann was the first to point out that the *Apocynum cannabinum*, L., which is used as a remedy in dropsy and like the oleander belongs to the Apocynaceæ, might contain a heart poison belonging to the digitalin class. In fact, from the root of this plant, which in its native country, North America, is official, two substances belonging to the digitalin group can easily be prepared, analogous to oleandrin and neriin.†

Apocynin is a resinous amorphous substance, very easily soluble in alcohol and in ether, but almost insoluble in water, of which a very small quantity is capable of producing the systolic pause in the heart of a frog with the characteristic phenomena. It does not appear to be a glucoside although upon boiling it in alcoholic solution, or suspended in water, with tolerably concentrated hydrochloric acid, a liquid is obtained which reduces cupric oxide in the presence of alkalies pretty freely; but this may be due to other decomposition products resulting from the strong action of the acid. The greater part of the resinous mass appears to remain unaltered; it has, however, become inert, not only in respect to the heart, but generally, and especially a picrotoxin-like action is no longer perceptible.

The second constituent is apocynein, which is a glucoside, and in its characters and solubilities agrees essentially with neriin, or digitalein. But like apocynin, it gives no remarkable reaction with sulphuric acid and bromine.

The preparation and purification of the two substances is effected in a manner similar to that followed for the constituents of the oleander.*

* *Archiv fur experimentelle Pathologie und Pharmakologie*, vol. xvi., p. 161.

† See before, p. 920.

THE ACTION OF CERTAIN METALS ON OILS.†

BY A. LIVACHE.

The action of metals on oils and particularly on drying oils has been made, by M. Chevreul, the object of studies of very great importance. From these studies it follows that under certain circumstances metals exercise a considerable influence on the oxidation of oils. Linseed oil, for example, rapidly becomes drying when it is spread upon the surface of a plate of lead. I have thought that the action of metals might be more efficacious if they were used not in the form of metallic plates, as M. Chevreul did, but in the state of fine division as obtained by precipitation. Experience has verified this supposition.

I have particularly studied the action exercised upon oils by lead, copper and tin; of these metals lead acts the most energetically.

Lead used in the experiments was prepared by precipitation from a solution of some of its salts by means of a plate of zinc; it was washed quickly, by water first, then by alcohol, then by ether, and dried rapidly *in vacuo*. If the lead thus prepared is moistened with a certain quantity of oil and exposed to the air, its weight will increase in a short time, and this increase of weight is greater as the oil is naturally more of a drying oil. Operating for example with raw linseed oil, the increase of weight reaches its maximum in thirty-six hours, whereas, exposed by itself to the air, this oil requires several months to reach its maximum. At the same time it appears to form a solid and elastic substance, analogous to that obtained in exposing boiled linseed oil to the air. With non-drying oils, the increase of weight, much less in amount, requires more time for its complete development.

The results which I propose to detail cannot be attributed to a simple mechanical division of the matter, which permits the air to circulate more freely through the mass, because the same experiment made with different substances in fine powder shows no analogous augmentation of weight; the process of oxidation goes on just as in the case of an oil exposed simply to the air in a thin layer.

The preceding experiment, made with different oils, shows that the increase of weight is practically proportional, except for cotton seed oil, to that observed with the fatty acids of the same oils, exposed to the air for several months. The drying is only more rapid because of the difficulty with which the air penetrates into the solid mass of the fatty acids. This is shown in the following table:—

* See before p. 920.

† From *Comptes Rendus*. Reprinted from the *Oil, Paint, and Drug Reporter*.

Oils experimented with, using precipitated lead.	Increase of maximum weight, after 2 days per ct.	Increase of maximum weight, after 3 days per ct.	Increase of weight of fatty acids exposed to the air for a period of 8 months, per cent.
Linseed oil . .	14·3	—	11·
Nut oil . . .	7·9	—	6·
Poppy seed oil .	6·8	—	3·7
Cotton seed oil .	5·9	—	0·8
Beech nut oil .	4·3	—	2·6
Colza oil . .	0·0	2·9	2·6
Sesame oil . .	0·0	2·4	2·0
Peanut oil . .	0·0	1·8	1·3
Cabbage seed oil	0·0	2·9	0·9
Olive oil . . .	0·0	1·7	0·7

Cotton seed oil, which is a drying oil, presents the only exception, the fatty acids, which are derived from it only acquire a slight increase of weight. This is, without doubt, the reason why they can, in the industrial arts, make it play the *rôle* of drying or not drying oil, in mixing it with either linseed oil or olive oil.

Again it is the direct action of the metal, and not, as might be supposed, the action of the air, to which is due the transformation which gives the oil power of increasing its weight and changing its physical state in oxidizing. If, in fact, linseed oil and a small quantity of precipitated lead are mixed and kept out of exposure to the air and light from time to time, the oil will soon be seen to acquire a slightly reddish tint; then if this oil be spread upon a plate of glass, the oil bleaches, and dries as rapidly as boiled oil, undergoing also as great an increase in its weight. The contact with precipitated lead, with exclusion of air, has communicated to the oil the property of rapidly absorbing oxygen.

In studying the oxidation of oils, M. Clorez has shown that this oxidation is always accompanied with total disappearance of glycerine; it appears, probably on account of the phenomena I am about to describe, that it is upon this glycerine that the precipitated lead exerts an equal part of its influence in modifying it. In effect, if we place in a flask, from which air is extracted, glycerine and precipitated lead, the lead will rapidly disappear, oxidizing at the expense of a part of the product and then dissolving. If raw linseed oil is taken in one instance, and in another instance boiled oil which has been acted on by precipitated lead with exclusion of air is taken; then if precipitated lead is moistened with these two oils, and each sample exposed to the air, an identical increase in weight will be observed, and consequently an equal capacity for absorbing oxygen, proportional, as I have shown, to the increase of weight acquired by the isolated fatty acids.

The preceding facts explain besides how, by a simple digestion at the natural temperature of linseed oil and litharge or minium, prolonged for some time, oil drying rapidly in the air can be obtained; nevertheless the oil thus obtained always retains some fatty matter (*du gras*); it dries less well and less rapidly than boiled oil. The boiling, especially if prolonged, and if the temperature is high enough, has the effect of producing a partial decomposition of the glycerine.

The study of the action of other precipitated metals, such as copper and tin, fails to give any results of interest; they only slightly increase in drying power. M. Chevreul already has announced this fact, from his experiments with plates of these metals.

Finally, it seems probable that the action of precipitated lead on the drying oils can be utilized to a certain extent in the arts.

In the first place, in the facts which I have made known will be found a rapid method for distinguishing drying oils (nut, linseed, beech nut, cabbage seed and cotton seed oils), from non-drying oils. The addition, now so frequent of cotton seed oil, for example, to linseed oil can be easily detected.

In the second place they give a means of substituting for the old-fashioned boiling, a simple agitation or stirring of the oils, or better yet, with exposure to air and at the natural temperature, the linseed oil can be circulated over plates of iron or zinc, on the surfaces of which metallic lead is precipitated. Oils thus obtained will be always less coloured, and will preserve a high degree of fluidity, while at the same time the disagreeable odours and danger of fire encountered in the present process will be avoided.

SYRUP OF SQUILL AND SYRUP OF IPECAC, SIMPLE AND COMPOUND.*

BY R. ROTHER.

It is almost a truism that, where there is a ceaseless effort to improve some process, there must abide a radical and obnoxious defect. Now, if the obstacle is radical in its nature, the aberrant cause becomes the dominant feature in the process, and remains a rich source of of empirical methods, until its principle is understood. For a long time fermenting syrups were a standing menace to elegant pharmacy. Not until alcohol in sufficient proportion was applied did the agitation in this regard end. For an equally extended period the pectose derivatives spoiled tinctures and syrups, until alkalies were employed to suppress the odious jellies. Many resins, which long were troublesome, likewise yielded to the solvent action of alkalies, especially in the presence of sugar. An extensive array of tinctures presented various defects in the way of turbidity, deficient strength, and retarded percolation and filtration, owing to the use of too weak alcohol in their preparation. An increased strength of the alcoholic menstrua swept away this multitude of grievous objections. Saline menstrua now serving excellent special purposes will eventually become more generally important. Acidulated menstrua have many particular uses, but some mischief and positive inconvenience has resulted from their too general employment, where their aid was by no means indicated. Syrup of squill is an example of such cases. Vinegars and wines are probably relics of primitive pharmacy. The fermented liquors earliest in use were so deficient in alcohol that acetic acid was speedily developed by secondary fermentation. The resulting vinegar being found possessed of antiseptic qualities naturally met with frequent application for this purpose. Hence, medicines as well as perishable articles of food were prepared with this acidulated solvent and preservative. Wines, perhaps, came later into use when improved methods produced them of greater alcoholic strength. When, however, distillation yielded still stronger alcohol, its use became general, and vinegars and wines dwindled to lingering rudiments in the modern organism of pharmacy. Syrups were originally made from medicated vinegars, and syrup of squill is prepared in that manner to this day. But an acidulated preparation of squill is contra-indicated in all its therapeutical applications. Squill is almost invariably given in connection with alkaline, saline or neutral mixtures. In pharmacy, also, a great disadvantage results when such mixtures are compounded, owing to the fact that physicians forget the acid nature of syrup of squill. This syrup is not only medicinally and chemically incompatible with alkalies and carbonates, but also mechanically with the latter by reason of the persistent frothy effeverscence set up in a syrupy liquid. Furthermore, when a fresh vinegar of squill is converted into syrup, the yet unchanged pectose derivative becomes insoluble as a bulky gelatinous precipitate.

The activity of squill is readily extracted by water, but a mixture of the drug and water gets rapidly putrid; if, however, an aqueous menstruum, containing one-eighth its volume of alcohol, is used, putrefaction and fermentation are prevented. Such an extraction yields no precipitate with sugar, and produces an elegant syrup, readily miscible with alkalies and acids without change. When the filtered macerate is treated with ammonia, a

* From the *American Journal of Pharmacy*, Feb., 1883.

considerable greenish precipitate is formed, which rapidly subsides and again quickly dissolves on the addition of sugar, but is wholly prevented when the order of mixture is reversed. Pharmacists will find a neutral syrup of squill very convenient in all such cases where the ordinary syrup is incompatible.

In the preparation of this syrup as well as of others, and also many tinctures, the method of remaceration proposed by the writer is far preferable to percolation and often more exact. Most crude drugs, such as roots, barks, and leaves, have a pretty definite normal of absorption, that is capacity for imbibing and holding menstrua. When this has been determined, a simple mathematical calculation will show how much loss is sustained, after obtaining a certain measure of decanted liquid. The normal of absorption of squill with one-eighth alcohol, is rather high, but since the drug is cheap, a loss of 20 per cent. is immaterial, when there is more than a corresponding gain in definiteness and quality of the product and facility in the process.

The application of heat in the preparation of syrups is chiefly objectionable on account of the large volume of liquid to be heated, and the difficulty of straining it whilst hot. To obviate all this, percolation was suggested. But this presents so many objections, that its few advantages were small by comparison. The cold process, by simple mixture and agitation, is so vastly superior to all others that it is fast coming into general favour. In cases of very dense syrups and such containing much alcohol, some difficulty is found in dissolving the last portions of the sugar. In preparing simple syrup such a residue is not objectionable, but in all other cases complete solution is imperative. To this end the writer divided the menstruum and used portions successively on the saccharine residue. However, an equally effective, but more facile method consists in mixing the whole, then stirring until most of the sugar has dissolved, decanting the syrup, heating the remainder until dissolved, uniting the whole, and straining. One gallon of neutral syrup of squill is prepared as follows:

Take of—

Squill, whole	10 troy ounces.
Sugar, granulated	96 „
Alcohol, Water	of each sufficient.

Mix alcohol and water in the proportion of one measure of the first and seven measures of the second, and pour 57 fluid ounces of the mixture upon the squill contained in a wide-mouthed bottle. Macerate this mixture for three or four days, with occasional shaking, and decant 32 fluid ounces of the liquid. Upon the residue pour 32 fluid ounces of the menstruum, and after three or four days decant as before. Mix the two decantates, filter and pour the filtrate on the sugar contained in an appropriate vessel; stir the mixture until most of the sugar is dissolved, decant about six pints of the syrup, heat the residue until dissolved, then mix the whole and strain.

Syrup of ipecac is another one of those protean compounds whose radical fault not being understood has caused it to pass through a great variety of changes. In this case the presence of a small amount of pectosic matter is, however, only part of the difficulty. The main cause of aberration resides in the large amount of resin that is contained in the root. In some of the former processes for this syrup it was assumed, on the statement that emetine, the active principle, being insoluble in water, that acetic acid must be used to render this soluble. But acetic acid brought no advantages for preventing a cloudiness which invariably appeared in the syrup. The resin was excluded in subsequent methods by mixing a fluid extract or a condensed alcoholic extraction with water, filtering and then adding the sugar; but the cloudiness still appeared although less obtrusively. The great and particular defect in this method was the fact that the acid resin carried with it a considerable portion of the activity. Later the writer extracted the root with acidulated water containing only enough alcohol to prevent fermentation. Under these conditions the gelatinous cloud was yet manifest, but subsiding rapidly left the supernatant syrup clear and bright. Deeming the jelly to be of pectosic origin and finding that a fluid extract of ipecac when mixed with ammonia remained clear the writer then employed an ammoniacal menstruum and found that both emetine and resin were readily and completely exhausted. The resulting deep brown solution produced a magnificent dark brown, clear, and permanent syrup on the addition of sugar.

The resin of ipecac is distinct from ipecacuic acid. The resin is insoluble in water, but extremely soluble in alkalies, especially ammonia. The thorough exhaustion of the root by means of an ammoniacal menstruum lends the appearance that if the acid resin formed native insoluble compounds with emetine these were dissolved by the ammonia. But this assumption is superfluous, since the statement of the investigators of emetine in regard to its insolubility in water is incorrect. Although emetine is precipitated from moderately concentrated solutions of its salts by ammonia and unaffected by an excess of the latter, it is yet quite freely and amply soluble in the large volume of water used in its extraction from the root. The writer found that when the ammoniacal extraction is evaporated to a syrupy liquid, again alkalinified with ammonia and shaken with a mixture of equal volumes of ether and acetic ether, a yellowish ethereal solution of emetine is obtained. This solution, on spontaneous evaporation left a yellowish crystalline residue of emetine. This when treated with water is converted into a cream coloured amorphous emetine hydrate. The crystals as well as the hydrate are promptly and perfectly soluble in acids from which ammonia precipitates bulky flakes of the hydrate in not too dilute solutions. Emetine is further remarkable in being much more bitter than its salts. Acetic ether is the great solvent of emetine, but owing to the ready miscibility of ethyl acetate with watery liquids, ordinary ether is advantageously added in the extraction from the crude residue. Emetine, although insoluble in ethyl oxide, is yet soluble in a mixture of the two ethers.

Returning now to syrup of ipecac, we have the formula for 4 pints, as follows:—

Take of

Ipecac, coarsely bruised	4½ troy ounces.
Sugar, granulated	48 troy ounces.
Calcium carbonate	½ troy ounce.
Ammonia water	¼ fluid ounce.
Alcohol, Water,	of each sufficient.

Mix alcohol and water in the proportion of one volume of the first and seven of the second, and pour 25 fluid ounces of the mixture together with ammonia water upon the ipacac contained in a wide-mouthed bottle. Macerate the mixture for three or four days, shaking it up occasionally; then decant 16 fluid ounces of the liquid. On the residue pour 16 fluid ounces of the menstruum, and after three or four days' maceration decant 16 fluid ounces as before. Mix the two decantates, add the calcium carbonate, agitate and filter. Pour the filtrate on the sugar contained in a proper vessel, stir until most of the sugar has dissolved and decant about 3 pints of the syrup. Heat the remainder until solution is effected, then mix the whole and strain.

The compound syrup of ipecac, or substitute for Dover's powder, is extensively in use. But it is not properly prepared, being fermentable and otherwise unsatisfactory. A permanent and elegant syrup containing ½ a grain each of opium and ipecac in the fluidram is prepared by the following ready formula:—

Take of—

Deodorized tincture opium	8 fluidrams.
Syrup of ipecac	10 „
Simple syrup, sufficient to make	75 „

Mix.

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REPORTS OF THE GOVERNMENT VISITORS ON THE PHARMACEUTICAL EXAMINATIONS.

THE reports of the Government visitors on the examinations conducted by the Pharmaceutical Society, which have lately been published, are more than ordinarily interesting this year, since they deal with several of the proposed alterations which have received the approval of the Council as well as with the general results of the examinations during the past. Dr. GREENHOW'S report refers only to the year 1882, but Dr. MACLAGAN'S report embraces a period of three years ending in January of the present year. In one very important point both reports concur most thoroughly, viz., the opinion that all who pass the qualifying examination as at present conducted are fit to carry on the business of a chemist and druggist with safety to the public. Dr. GREENHOW with justice regards this as the essential purpose and requirement of the Pharmacy Act, and Dr. MACLAGAN expresses his belief that the Minor examination affords ample security for the public safety at the hands of those who obtain these diplomas. But while agreeing in this view with Dr. GREENHOW, he admits that there is still need for the creation of a class of pharmaceutical practitioners possessing higher scientific qualifications than either the Minor or even the Major examination provides for, and he expresses a hope that if the proposed alterations are carried out the standard of the qualifying or pass examination may be raised at least up to the level of the present Major.

It may, therefore, we think, be inferred that the satisfaction felt by Dr. MACLAGAN, at least in the results arrived at by the system now in force, is due rather to the efficient manner in which the examinations are conducted than to any profound belief in the sufficiency of the regulations applying to them. It is indeed conceivable that with a less careful and conscientious body of examiners the results obtained under the present regulations might be far less satisfactory even from this point of view which is taken by the Government visitors. If this be a correct inference, it would to a great extent justify the recommendations of the Council with a view to making the examinations a more complete test of competence. In fact, Dr. GREENHOW, in reviewing the effects of various changes that have already been made from time to time, admits that those changes have unquestionably raised the standard of the Minor, and he expresses his approval of this result, which he considers to have been inevitable and necessary if the intention of the Pharmacy Act was to be fulfilled. He well points out that in commencing a system of compulsory examination it would have been manifestly inequitable to have passed at once from the laxity which previous to the enactment of the Pharmacy Act permitted persons to carry on the trade of a chemist and druggist without any recognized qualification, and to have exercised a degree of strictness which would have made the examinations press hardly upon a large number of candidates whose education had been commenced before the Act came into operation. At the same time he also admits, what is really the logical consequence of such a considerate application of the system of examination, that at a later period it was quite proper to make the examinations more thorough and practical, and to introduce such changes as experience may have shown to be desirable.

It would, we think, be unwise to assume that the necessity for such a gradual raising of the standard of the qualifying examination has ceased to exist, for whatever may be thought of the competence of those who pass it, we must not lose sight of the fact that the large number of rejected candidates furnishes evidence of a want of adequate preparation for the ordeal, and, as Dr. MACLAGAN says, of ignorance of what constitutes preparedness. The great desire with too many is to pass, and merely to pass by any means, without any proper regard to what is requisite in order to make the passing of the examination a matter of course.

The provision that passing the Preliminary examination should be essential before the commencement of the period of apprenticeship or pupilage would no doubt contribute largely to reduction in the number of candidates rejected at the Minor examination, and we are glad to see that the proposed alteration has the entire approval of Dr. GREENHOW, as well as that requiring the candidates for the Minor examination to produce evidence of apprenticeship or pupilage of not less than three years with a duly registered chemist and druggist.

Dr. GREENHOW is a strong advocate for adherence to the system of apprenticeship, and he thinks the Pharmacy Act to be defective in not having made it compulsory. His argument in favour of that opinion is a strong one, and we are quite in accord with him as to the value of long and constant practice as a means of acquiring practical acquaintance with drugs and the manipulative skill required in compounding them. But it must not be for-

gotten that compulsory apprenticeship affords no sufficient guarantee that the apprentice will be enabled to gain the knowledge and skill desirable, and Dr. MACLAGAN very pointedly refers to this circumstance in his report by stating that there can be little doubt members of the pharmaceutical profession to a large extent do not do their duty properly to their apprentices. He adds that if the apprentice is merely to learn the routine duties which fall on anyone standing behind a counter, six months would be enough for the purpose, and the three years' apprenticeship might be abolished with advantage.

It behoves those who complain of the difficulty in obtaining apprentices to consider well the remarks of Dr. MACLAGAN on this subject, and to inquire whether they may not be to blame for the want they experience rather than any supposed undue stringency of the examinations which is sometimes put forward as the reason why apprentices cannot be obtained. If the apprenticeship system is to be merely a device for obtaining cheap labour it can but contribute towards the maintainance of the large number of rejected candidates for the Minor examinations, and if, as now intended, it is to furnish evidence that candidates have had opportunities for acquiring practical skill and knowledge of their business, it should imply a certain responsibility on the part of the master for the pupil's progress.

On the general subject of a curriculum of study the opinions of the two Government visitors of examinations are less in accord. While Dr. MACLAGAN, in referring to his previously expressed recognition of the necessity for pharmaceutical students going through a regular curriculum of study, again states that the results of the last three years have led him to observe how much candidates, whether successful or not, require more methodical instruction, Dr. GREENHOW is not disposed to think it necessary to enforce attendance on a regular course of lectures, though he would not discourage candidates from attending such a course of instruction at their option.

Dr. GREENHOW's opinion on this point is based upon the statement in the preamble of the Pharmacy Act, that for the safety of the public it is expedient that persons keeping open shop as chemists and druggists, etc., should possess a competent practical knowledge of their business. He infers from this that no restriction beyond what is necessary for the safety of the public was intended to be imposed upon pharmacists, namely, that they should be examined as to their practical knowledge. We have on previous occasions pointed out that though this view is one that is sound from the standpoint of a public official it fails to take into account what is requisite for the advancement of pharmacy or for attaining the objects set forth in the preamble of the Pharmacy Act, 1852, and in the Society's Charter of Incorporation.

ELECTRICAL UNITS OF MEASUREMENT.

THE last of the series of lectures on the practical applications of electricity, arranged by the Council of the Institution of Civil Engineers, was delivered by Sir WILLIAM THOMPSON on the 3rd inst., the subject being "Electrical Units of Measurement." Premising that no real advance is possible in any branch of physical science until practical methods for a numerical reckoning of phenomena have been established, the lecturer pointed out that the first advances towards a system of measurement in electrical science were made in the last century by CAVENDISH and COULOMB, and that further and rapid progress towards a complete foundation of the system was effected by AMPÈRE, POISSON, GREEN, GAUSS, and others. But as late as ten years ago, regular and systematic measurement in electrical science was almost unknown in the chief physical laboratories of the world. Now, however, electric measurements are of daily occurrence, not only in scientific laboratories, but in workshops; ohms, volts, ampères, coulombs and microfarads have become common terms, and measurements in these units are commonly practised to within 1 per cent. of accuracy. It seems indeed as if the commercial requirements of the application of electricity to lighting and other uses of every-day life are destined to give an important impulse to the higher region of scientific investigation.

Sir WILLIAM described the first step towards the numerical reckoning of properties of matter to be the discovery of a continuously-varying action of some kind, and the means of observing and measuring it in terms of some arbitrary unit or scale division; while the second step would necessarily be that of fixing on something absolutely definite as the unit of reckoning. GAUSS'S principle of absolute measurement of magnetism and electricity is merely an extension of the astronomer's method of reckoning mass in terms of what may be called the universal gravitation unit of matter, and the reckoning of force, according to which the unit of force is that force which acting on unit of mass for unit of time generates a velocity equal to the unit of velocity. GAUSS'S work was of great importance, as was that of WEBER. But it was the British Association Committee which, after eight years of labour, fairly launched the absolute system of measurement, subsequently accepted at the International Conference for the Determination of Electrical Units, held in Paris in 1882, and which also effected arrangements for the supply of resistance coils, in terms of a unit, afterwards named an "ohm," to be as nearly as possible 10^9 centimetres per second.

The ultimate principles of scientific measurement were illustrated by the case of an ideal traveller through the universe who desired to make for himself a metrical system agreeing with that which he had left behind him on the earth, but who possessed no weights, measures, watch, chronometer, standard vibrator, or spring balance, but merely EVERETT'S 'Units and Physical Constants' and a complete memory and understanding of its contents. It was shown experimentally how he could readily and accurately recover his centimetre by ascertaining how many wave-lengths of sodium light there were in the distance between the

bars of a grating that he could engrave for himself upon a piece of glass. Having recovered his centimetre measure, he would have the choice of various methods for recovering the unit of time. One way would be to take an accurately measured Leyden jar of known capacity, arrange a mechanism for charging it to an accurately measured potential and discharge it at frequent regular intervals through a galvanometer coil; this would give an intermittent current of known average strength, measurable in electro-magnetic measure by an ordinary galvanometer. The number found upon dividing the electrostatic reckoning of the current by the experimentally found electromagnetic reckoning of the same is v in centimetres per the arbitrary unit of time which the experimenter has used in his electrostatic and electromagnetic details. It is hoped that before long the value of v will be known within one-tenth per cent., but at present it is only known that it does not probably differ 3 per cent. from $2{\cdot}9 \times 10^9$ centimetres per mean solar second.

The remainder of the lecture was occupied with an explanation of the application of the absolute system in all the branches of electric measurement, and the definition of the practical units founded on it, now known as ohms, volts, farads, microfarads, ampères, coulombs and watts. In addition the name "mho"—being the word "ohm" reversed—was suggested for a unit of conductivity, the reciprocal of resistance, together with the subdivision "millimho," which would be exceedingly convenient for the designation of incandescence lamps.

We understand it is probable that the company at the Annual Dinner on Tuesday next will be more numerous than on any similar occasion for some years past. It is therefore extremely desirable that persons still requiring tickets should communicate at once with the Honorary Secretary, Mr. Richard Bremridge, as it will be imperatively necessary to close the sale sufficiently early to enable proper arrangements to be made.

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It may interest some of our readers to learn that at the Society's Conversazione on Wednesday next the music in the North Court of the South Kensington Museum will be performed by the Hungarian Band, under the direction of John Kalozdy, and that the glee singing in the Lecture Theatre will be supplemented by the singing of ballads by Miss Clara Samuell.

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The second reading of the Medical Acts Amendment Bill, which was fixed for the 10th inst., has been deferred until Monday, the 21st inst. As, however, it is preceded in the list by seven other orders of the day, some of them of considerable importance, a further postponement seems inevitable, especially as the Bill is "blocked" and, therefore, cannot be brought on after half-past twelve.

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From a memorandum by Professor Chandler Roberts on the recently issued Report of the Deputy-Master of the Mint it appears that the expression of the composition of gold ingots by the carat system, which has survived from the earliest times of which there are Mint records, is likely to be abandoned in favour of a decimal expression. As is known, the "carat" system consists in recording the alloy to be so many carats "better" or "worse" than standard, and is founded on an ideal unit, the "carat pound," which is divided into twenty-four parts, termed "carats," British standard gold containing twenty-two carats of gold and two carats of alloy in every twenty-four parts. The "carat" is sub-divided into four "carat grains," the "carat grains" into "eighths of a carat grain," and these are again subdivided into seven and a half parts, constituting "excess grains," being each equal to $\frac{1}{5760}$ of the carat pound. The method newly adopted is the decimal form, the report being expressed to the 0·0001 part.

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The *British Medical Journal* quotes a curious instance of the curative effects following the scientific use of the imagination, though not in exactly the sense intended by the inventor of the phrase. A hysterical patient, who had previously suffered from chorea, was received into the Charité, unable to raise herself in bed and with marked contraction of the lower limbs. After one or two hypodermic injections of morphia, she was given "a more energetic remedy," which she was told to use cautiously. The patient finding herself in possession of such a medicine was seized with a desire to poison herself with an overdose and swallowed the whole. The immediate effects she described as being terrible, but soon afterwards she found herself able to walk, and the cure was completed by a further dose of—bread pills!

* * *

The Executive Committee of the International Pharmaceutical Exhibition to be held in Vienna next August, under the presidency of Herr A. von Waldheim, appears to be sparing no pains to ensure its success. It has just issued a circular to pharmaceutical associations generally, as well as individual pharmacists, asking them to contribute towards its success by exhibiting old documents and other objects of antiquarian interest, as well as pharmaceutical collections and apparatus. In consideration of the scientific object of the exhibition the Imperial Foreign Office has expressed a wish that all possible assistance may be given to it by the consular staff. The time for receiving applications for space will definitely expire on the 31st inst.

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The Programme of the Meeting of the British Association at Southport in September next has just been issued. The first general meeting will be held on Wednesday, September 19, at 8 p.m., when Sir C. W. Siemens will resign the chair, and Professor Cayley will assume the presidency and deliver an address. On the next evening there will be a soirée and another on Tuesday, the 25th. On Friday evening, September 21, Professor R. S. Ball, Astronomer-Royal for Ireland, will deliver a discourse on "Recent Researches on the Distance of the Sun," and on Monday evening, September 24, Professor McKendrick will deliver a discourse on "Galvani and Animal Electricity." The concluding general meeting will be held on Wednesday, September 26. Dr. J. H. Gladstone will be the President of the Chemical Science Section.

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The second Annual Meeting of the British Association of Inspectors of Weights and Measures is to be held in Sheffield on Thursday, May 31, and following day.

Provincial Transactions.

GLASGOW CHEMISTS AND DRUGGISTS' ASSOCIATION.

The Draft Pharmacy Acts Amendment Bill.

A special meeting of the Chemists and Druggists' Association of Glasgow was held on the evening of Wednesday, May 2, in Anderson's College, Glasgow, for the purpose of discussing the paper by Mr. Daniel Frazer, delivered to the Association on April 10 (see before, pp. 845 and 865), on the proposed changes in the Pharmacy Act of 1868. Mr. McAdam (of the Glasgow Apothecaries' Company), President of the Association, occupied the chair. There was a large attendance of members.

The Chairman said the Secretary had endeavoured to fix this adjourned meeting so that Mr. Frazer could have been present, but, unfortunately, Mr. Frazer had had to go to London, so that the arrangement had not suited him. It was, therefore, necessary to proceed in his absence, and he would be glad to hear the opinion of members upon the subject.

Mr. A. Kinninmont, after a passing reference to Mr. Giles's paper in the *Pharmaceutical Journal*, said while listening to Mr. Frazer's lecture he had been irritated to hear one word reiterated throughout the whole of it, and that was the word "monopoly." "Monopoly" was a word now only used in a bad sense. It was something to throw at an opponent and to condemn his position without argument; it was begging the question by an epithet. He entirely denied that the present trade of chemists and druggists was in any sense a monopoly. In the preamble of the Act it was said, "Whereas, it is expedient for the safety of the public that sales of poisonous articles should be regulated;" that showed that the trade was a restricted one, and that the restrictions existed not for the purpose of bringing profit to those who carried it on, but for the safety of the public. The trade stood in a similar position to many other businesses. For instance, you may wish to manufacture dynamite or gunpowder: the trade is open to you, but before you can do so you must comply with certain conditions intended to insure the public safety. Before you can become the captain of a ship you must qualify yourself for the duty, and no ship is allowed to sail unless on board it there are at least two persons holding masters' certificates. These were restrictions, but not monopolies, and the trade of a chemist and druggist was similarly placed. To call it a monopoly was an abuse of terms. It was a word that would prejudice their case, because in these days of free trade the words monopoly and protection went together in the popular mind. As for the Bill he had no objection to the preamble. Mr. Frazer objected to the definition clause; but if any one wished to get a thorough understanding of it he should read the decision in the case of the Pharmaceutical Society against Mackness, and he would then see the necessity for this clause. He would see that in that case, because the word "corporation" was not included in the Pharmacy Act of 1868, that the judges were of opinion that corporations could do things that individuals had no power to do. That was a most dangerous doctrine, but he thought this Bill would put an end to it. Mr. Frazer seemed to be very angry about the sale of "poisonous" articles. But chemists now claimed no special right to sell these "poisonous" articles. All the articles that were proposed to be called "poisonous" were sold by anybody; by ironmongers, by hucksters and by many others. But what objection could there be, on the ground of public safety, to the proposals in the Bill? They knew that when a man in the dark drank a bottle of poison in the belief that it was ale or something of the kind, that there was one fool less in the world. Still, it was necessary to guard against accidents, and if a man found a label on a bottle he would be cautious before he drank its contents. This was an unselfish proposal; it was made solely in the interests of public safety. Mr. Frazer underrated the danger. There could be little objection to drysalters being compelled to label the poisons they sell, the same as chemists always do, with the name and address of the seller. Then as regarded wholesale houses it was provided that every wholesale dealer shall keep a record in writing of the name of such poison, the quantity sold, the name and address of the purchaser, and the date of sale, and should preserve such record for twelve calendar months. He could not see that there was any hardship in that. It affected only certain sales. Some of his hearers might remember the case of poisoning in Glasgow by Dr. Pritchard. Many members of the Glasgow Druggists' Association were examined in evidence upon that case, and the poisoning was brought home to the criminal solely by the fact that the doctor had purchased some poison, which he did not pay for at the time, and had he paid for it the crime might never have been traced. This would show the necessity for this clause in the interests of public safety. Then there was the clause as to the labelling of patent medicines being or containing a poison. It had always been his opinion that patent medicines containing poisons were not covered by the Pharmacy Act of 1868. An Act of Parliament could not have a private interpretation, and it could not be stated with certainty what an Act meant until a judge's opinion on it was obtained, as a decision carried authority with it and settled the question. But a passage in the Act seemed to settle the question. In section 16 it says:—"Nothing hereinbefore contained shall extend to or interfere with the making or dealing in patent medicines," and, observe, "nor with the business of wholesale dealers in supplying poisons in the ordinary course of wholesale dealing." In section 17 it says—"It shall be unlawful to sell any poisons, either by wholesale or retail, unless the box, vessel, wrapper or cover, in which such poison is contained, has the name and address of the seller." If the intention had been to have covered patent medicines it would have been distinctly stated. Mr. Frazer spoke of the strength of the patent medicine interest. But what was that patent medicine interest? Mr. J. Walker gave some statistics about it a month ago. The whole transactions in patent medicines would give each holder of a patent medicine licence at the very most £67 a year. As he (Mr. Kinninmont) held licences for two shops, Mr. Frazer for two, and the Apothecaries' Company for two, it could be seen what a small trade it was. This trade, before which Mr. Frazer bids the Pharmaceutical Society recoil, meant a yearly value of about £650,000, and that included stamps. The proposed clause was necessary in the public interest. He would pass over several clauses now, for he could not find any fault with them. Mr. Frazer, however, objected strongly to the 9th clause—"Duly qualified persons to sell medical prescriptions and sell poisons." It seemed to him (Mr. Kinninmont) that the dispensing of medical prescriptions should be restricted to competent people. He did not see on what grounds Mr. Frazer thought that in this there was any breach of free trade. He could not see how Mr. Frazer came to that conclusion, unless on the ground that having never been in any shop but his own, and having never seen trade as conducted by ignorant people outside, he did not know the danger the public were in. Many of his hearers who had been about the country would be able to recall instances where want of skill, while not perhaps endangering life, at least hindered recovery. A customer should get exactly what is ordered for him, and only competent and skilled persons could give that. Then there was the clause as to the registration of the names of proprietors of shops. That was a very important question. As Local Secretary of the Pharmaceutical Society, he had occasion to go about asking the names of proprietors of shops; and although the question was not a pleasant one, he had never had an uncivil answer, or been received uncivilly, during his expeditions; still there was great difficulty sometimes in finding out

who was the real proprietor of a shop. He thought this clause would settle the question. As regarded penalties, that was a thing they could not say much about. Section 12 of the Bill raised a most important question. As at present carried on he thought—and he had been an examiner for some years—the examinations were quite equal to all requirements for the safety of the public; and while he would wish to do nothing in regard to the subdivision of examination that would make it easier for a candidate, he would oppose anything that would make it more difficult or more expensive. He was not afraid of any action of the Council of the Pharmaceutical Society in this matter. Observe the class of men who were the leading pharmaceutists in London; they were all men in high position. In this matter they had nothing to gain by the advancement of the trade generally, but everything to lose. Their skill and position raised them above the trade generally, and their efforts to elevate the trade to their own level tended to make their prominence less. As regarded these examinations, he held, like Mr. Frazer, that it would be sufficient for the public safety, and for the candidate's convenience, that they should be made by a society like the Pharmaceutical Society. He thought, too, these examinations were needed for the public safety. He could not say that they brought chemists profit, but they might bring them position. The public was not sufficiently thankful to them for the care they took in insuring its safety. One reason was that it did not know. There was one thing that had struck him very much in connection with the discussion on this Bill, and that was Mr. Frazer's "pharmaceutical politics." He talked as if the Bill were directed against stores, such as co-operative and civil service stores. That was a mistake; he (Mr. Kinninmont) did not think the Bill was directed against these stores, nor did he think anything chemists could do could prevent these stores from dispensing. On a previous evening he had explained how easily it could be avoided by stores engaging a qualified man, and putting up "John Smith, pharmaceutical chemist, in connection with the Civil Service Association." In concluding, Mr. Kinninmont said he would be glad to answer any question that might be put to him on this subject.

On the suggestion of Mr. D. Lees it was agreed to go over the Bill clause by clause, the Secretary (Mr. Paris) reading each clause as it came up for discussion.

Mr. D. Lees moved, and Mr. J. Walker seconded, that the preamble be approved; and the motion was adopted.

Mr. D. Lees proposed to reject the definition clause. It was admitted that this clause was directed entirely against stores. The Bill was for the safety of the public, but was there any more safety offered to the public by a man having a branch over which he could take no control than by a co-operative store managed by a qualified assistant? He would object to co-operative stores being allowed to have shops without qualified assistants; but at the same time he would object to chemists and druggists having more shops than one. He thought it would be necessary either to leave out the eighth clause of the Bill, giving chemists the privilege of having branch shops, or to reject this definition clause.

Mr. Chalmers seconded the motion.

Mr. A. Kinninmont objected very strongly to the motion, because every member of a co-operative store might call himself a pharmaceutical chemist because there happened to be one on the premises. He claimed the right to have as many branches as he chose. The law did not require there should be a qualified man in any of them; but a co-operative store might open a hundred branches and not have a qualified man in the whole concern. Mr. Lees seemed to think there was no difference between an unqualified man carrying on business and a qualified man, but he would find himself much mistaken. Let him try to manage a business for which he was not qualified, and he would see his mistake. Although a man might have twenty branches and only visit them once a week, he could still exercise an oversight and care over everything that was done in them. He (Mr. Kinninmont) had a dislike to branches in his youth, because he was so much troubled with them, but he now considered the objection to branches a pharmaceutical phantasy. He would move as an amendment that the definition clause be supported.

Mr. John McMillan seconded the amendment.

On a vote, the amendment was carried by a majority of three votes.

The second clause was then taken up.

Mr. R. Brodie said some of the articles proposed to be included in the "poisonous" schedule were more dangerous than some of the things which were included in the original schedule. For instance, more accidents had arisen through the misuse of carbolic acid than almost any other thing, and that not through the carelessness of the chemist, but through the carelessness of people who drank it without first smelling it.

Mr. A. Kinninmont said carbolic acid was largely sold by ironmongers in the country for sheep-dip; that brought them again into the monopoly question, about which Mr. Frazer talked.

Mr. R. Brodie said he was not aware it was used for that purpose.

Mr. J. Walker moved that this clause be supported. He failed to see what difference there could be between a bottle labelled by an ironmonger and one labelled by a druggist; the labelling of poisons was what was wanted.

Mr. J. Walker said the third clause affected the wholesale trade, and if the meaning of it was that a separate poisons book had to be kept, such as was kept by retailers, he would oppose the clause simply on the ground that it was not necessary, except in the sense Mr. Kinninmont referred to in his remarks on cash sales. In all the wholesale houses he ever heard of, all that would be necessary would be to look over their wholesale books.

Mr. A. Kinninmont said the clause was framed to cover such cases as Lamson's, Pritchard's and such like.

The clause was adopted.

On clause 4, Mr. J. Walker said it would be quite competent for the seller to put the word "poison" on the outermost wrapper if the maker did not do so, because in the case of patent medicines coming from France and America, unless this could be done, the question would be raised as to whether it would be safe to keep them.

Mr. R. Brodie said he did not know which patent medicines contained poisons. Winslow's Syrup contained a poison, yet the editor of the *Chemist and Druggist* said a few years ago that he had tested it in all manner of ways to see if it contained morphia, but he failed to discover any, and he had no hesitation in saying that it did not contain poison. How was the seller to find out such as contain poison?

Ultimately the clause was adopted.

Clauses 5, 6, and 7 were then adopted without comment.

On clause 8, Mr. Lees said he should have had something to say on this had the definition clause been rejected, but since it had been approved he would offer no objection to clause 8.

The clause was approved,

On clause 9, Mr. J. Walker moved that this clause be not approved of, in so far as that part relating to patent medicines is concerned. Notwithstanding the remarks of Mr. Kinninmont, there could be no doubt that a great deal of these things were put in—it might be called monopoly or anything else—to keep their trade to the chemists and druggists. There was no use in saying it was for the benefit of the public, for they had passed a clause which would compel all persons who sell patent medicines containing poisons to label them as such. The public was no safer by a chemist selling patent medicines than by a grocer.

Mr. A. Kinninmont said in England many places of business held patent medicines licences, and it was as

much against these as anything else that the clause was directed. If they were to admit—which he did not—that the patent medicine stamp covered poison, then any poison could be sold as a patent medicine. He did not think the clause would interfere with any legitimate business.

The amendment was dropped, and the clause was adopted.

Clauses 10 and 11 were approved.

On clause 12, Mr. Lees said, as an amendment to this clause, he would move that the following part be omitted, "and to require and regulate periods of time and of practical experience, or any course of study, lectures, examinations, or any divisions of the same." The part he wished left out was the part which would give the Pharmaceutical Society the power of enforcing a curriculum. This curriculum was recommended because it was said the examinations were imperfect at the present time and afforded no sufficient test of a candidate's ability. The real question was, supposing the examinations were imperfect, could an enforced course of study be a sufficient remedy? He did not think so. It was possible for students to attend classes or lectures and be very ignorant of the subjects they were supposed to be studying until within the last month or so, and then cram up for the examinations. It was impossible to prevent students from adopting some such method as that. So long as the knowledge was secured it was not easy to understand why any objection should be urged against it. Students might, also, only get up the subjects to be set before them for examination, without understanding those subjects or their relations to each other. He thought the proper way was to let a student get his knowledge how and where he pleased, so long as he passed his examination. He approved, however, of giving the Pharmaceutical Society power to subdivide their examination. It was a mistake to conduct the examination in one day. At all events, the examination should be conducted so as to afford undoubted proof of the candidate's ability. He would not object to making the examination more stringent, but he very strongly objected to a particular course of instruction, as it was neither necessary nor desirable. It would be a pleasant change for an assistant to leave the counter for a few months, but by doing so he might lose a comfortable situation and his master a valuable assistant. It would involve a considerable pecuniary loss, scarcely to be compensated by £70 or £80 a year. He admitted that the trade was overcrowded, but he did not think that an enforced curriculum would be a sufficient remedy for the evil.

Mr. A. Boyd seconded the motion.

Mr. A. Kinninmont said that the examiners at present resembled London University. They say, "Where is the knowledge?" and not "Where did you get it?"

Mr. A. B. Chalmers said it was a pretty general opinion in Glasgow that while there is no doubt that this curriculum might be injurious to the prospects of many who are at present connected with the business, there was but one opinion as to its practical utility. Any young men about to enter the business would be prepared, of course, to undergo this curriculum and they would go about their work in a systematic manner. The result could be nothing but gain to themselves and their business. For himself, and many more in the same position, it would have been satisfactory if the Pharmaceutical Society had enforced a curriculum ten or twelve years ago, because in that case they would have stood in a very different position in regard to it now.

The clause was adopted with Mr. D. Lees's amendment.

On clause 13, Mr. A. Kinninmont said he objected to that clause in the Council, but he had been told it did not apply to Scotland, seeing that they did not bind apprentices there. It was intended for the protection of apprentices.

Mr. W. Paris proposed that this clause be not approved of. He said he was in the trade twelve months before he knew there was such a thing as an examination at all.

Mr. J. Arnot seconded the motion.

The motion was adopted, and the clause rejected.

Clauses 14, 15, 16, 17, 18, 19, 20, 21 and 22 were agreed to without comment.

On clause 23,

Mr. Lees said he would propose an extension of the time for the Act coming into force on the date stated. He was not afraid of it passing this session, but he did not want to admit that it would be desirable to let it come into force in 1884. He thought a year or two should intervene, so that all might be prepared for it.

The suggestion by Mr. D. Lees was adopted generally.

The Bill as amended was then approved of generally, and it was agreed to transmit the amendments and suggestions to the Council of the Pharmaceutical Society and to all interested in the Bill.

The meeting then separated.

HAWICK PHARMACEUTICAL ASSOCIATION.

At a meeting of chemists' assistants and apprentices, held in the Chemical Laboratory, on Tuesday, 17th ult., it was resolved, after a short discussion, to form the Hawick Pharmaceutical Association. A constitution having been adopted, the following office bearers were elected: — Honorary President, Mr. Thomas Maben; President, Mr. John Grieve; Secretary and Treasurer, Mr. James A. Hislop; Librarian, Mr. W. B. Rawlinson.

The first meeting of the Association was held on Tuesday, 15th inst., when there was a good attendance. The President, Mr. John Grieve, occupied the chair and, after a few preliminary remarks, briefly introduced Mr. Maben, who delivered the following inaugural address on—

The Pharmacy of the Future.

It was with very great pleasure that I heard of the formation of this Association by the young men connected with pharmacy in Hawick, although that pleasure was not quite unalloyed when you requested me to become its Honorary President. I feel it, however, to be my duty not to shirk the responsibility, and having consented to take the position you so kindly assigned me, it is I presume, in the usual course that we meet to-night to hear the inaugural address, so that in some formal manner the work of the Association may be begun.

The formation of this Association ought to mark the beginning of a new era in the pharmacy of our old border burgh, while its inception will, we trust, be happily coincident with the greater epoch in the pharmaceutical history of the country which, it is hoped, will render memorable the year 1883. In view of the upheaval which is now going on, and which threatens to obliterate some of the old landmarks of our profession, or rather proposes to remove them further out, so that we who are within may have more scope for our energies and more space to breathe, it is pre-eminently fit that you should have seized the present as the opportunity for establishing an Association, the object of which is the pharmaceutic and scientific enlightenment of its members. If pharmacy is to improve its position, the younger men must prepare themselves to be ready to enter in and "possess the land," and no surer means to that end can possibly be made use of than the work of an association such as this. Since 1868, the old order of things, which few of us know anything about, has been rapidly passing away; the present is a time of transition, a probationary period, if I may so speak, and we are now standing on the threshold of the new order which must soon develop itself. What the pharmacy of the future is to be lies absolutely in our own hands, and it is a matter of the utmost concern, not only that the present crisis should be well and safely over, but that the youth among us

should be wisely and judiciously trained in view of the time when on them shall have fallen the mantle of those to whom it is given for a season to mould the destinies of the profession. I propose to-night to give you my idea of the pharmacy of the future, but in order that you may have an intelligent appreciation of the whole question, I shall refer briefly to the past, then give a short sketch of what is being done at present, and from these we may be able to forecast what is in store for us.

The passing of the Pharmacy Act of 1868, beyond which we need not go, constituted a most important epoch in the history of pharmacy. Previous to this any person, qualified or unqualified, was at liberty to retail poisons, with what results all of us may readily imagine. The condition of pharmacy was, in the opinion of an eminent member of the Medical Council, a disgrace to the country, and the safety of the public, not to speak of other considerations, urgently demanded reform. The outcome of the agitation which had been going on for many years previous to 1868 was the passing, in that year, of the Act to which I have just referred. This Act was for all practical purposes simply a Poisons Act, though as a necessary consequence it provided for the qualification of those who should be entitled legally to sell poisons. It may be not unfairly summarized as an Act to provide for the registration of all pharmaceutical chemists and chemists and druggists, qualified by examination or otherwise, who alone could legally sell by retail certain specified poisons. These poisons, however, are in such constant requisition by the public, and occur so frequently in medical prescriptions, that the Act practically prevents all unqualified persons from engaging in the business of a chemist and druggist. This enactment, the result of an agitation carried on more or less vigorously for the previous twenty-five years, marks the beginning of what I have already called our present period of probation.

The fifteen years that have since gone by have more than proved that this Act cannot be regarded as a final settlement of the question, and this is just what might have been expected. That from the comparative chaos which previously existed, a perfect cosmos should at the first attempt have been produced was improbable, and it is a gratifying circumstance that the progress already made has been so marked. But though pharmacy occupies a much higher position now than twenty years ago, we are still very far from the goal towards which we may legitimately aspire.

There are several points in which the Act of 1868 has proved defective, and these I shall as briefly as possible indicate.

1. While it is true that the law relating to such poisons as arsenic, strychnine or opium may be stringent enough, there are a class of very dangerous substances which are not, but which ought to be included in its scope. Provision was made in the Act for adding from time to time to the list of scheduled poisons, the ultimate authority in such cases being the Privy Council, and several additions have consequently been made, such as chloral hydrate and nux vomica and its preparations. There still remain, however, a large number of other poisons, *e.g.*, carbolic, hydrochloric, nitric and sulphuric acids, butter of antimony and hellebore, which, although as liable to fatal misuse as any poison in the schedule, are not regarded as poisons by law. Without doubt, every druggist with a reputation to sustain, is careful to label these articles "poison;" but he is under no legal obligation to do so, and any person is at perfect liberty to deal in them to any extent he chooses. In the course of last year, the Council of the Pharmaceutical Society resolved that these articles should be poisons within the meaning of the Act, but the requisite sanction was refused by the Privy Council, the nominal reason being that the change was inexpedient in view of probable early legislation on the whole subject.

2. It is a remarkable fact that a druggist cannot retail solution of morphia without labelling it "poison," while he or any one else may sell it in any quantity under the name, *e.g.*, soothing syrup, provided only there is a patent medicine stamp on the bottle; and whereas a poisonous dose of prussic acid could be got with the utmost difficulty and only after elaborate precautions had been taken, a would-be suicide might obtain from the nearest patent medicine dealer, twenty doses of poison and no questions asked if only he invests in a bottle of somebody's chlorodyne. This is an utterly anomalous condition of things, and one that demands immediate remedy. It is of grave importance that the public should know that when they use certain patent medicines they are handling deadly poisons, but as a rule there is no indication on the labels that this is so, and hence there need be little wonder that repeated deplorable accidents should occur through the lack of proper precautions in this respect. Perhaps it is somewhat out of place for me to refer to this matter here, but I would fain give expression to the feeling of disgust with which every true pharmacist regards the patent medicine trade. Were it not that by keeping it in our hands we can, to a certain extent, restrain the evil, I am certain that very many among us would throw the whole traffic overboard.

3. Another point where the Act has failed is in what I may call personal qualification. Before a person can be duly qualified to open a shop and conduct business he must pass at least two examinations. The first of these is Preliminary, the object being to ascertain whether or not the candidate has received such an elementary education as will fit him for the position to which he aspires, and give a guarantee that he will, so far, be capable of going forward to the qualifying or Minor examination with a prospect of success. In addition to passing the Preliminary the student requires to be engaged for three years in practical pharmacy before he is permitted to attempt the Minor examination. The possession of the Minor certificate is sufficient to qualify a man to keep open shop, but it has been found by experience that a large number of candidates come up to the examination who are not educated, but simply stuffed full of words and phrases and answers to questions. Undoubtedly a certain proportion of these pass the examination in the same way as the turkeys whose crops were loaded with shot took the prizes at a Cumberland show the other day; but alike in the examination and in the show, success is the result of fraud, though in the former case discovery comes too late, the now disgorged examinee being safe with his certificate. But there are one or two particular instances in which the Act breaks down in this matter of personal qualification, independently altogether of what is called "cram." The first of these is branch shops. At the present moment a druggist may have any number of branch shops, and may carry them on by means of apprentices if he choose to do so. For example, any Hawick druggist might open shops in Melrose, Jedburgh or Galashiels, and put mere boys in them, and no one could interfere with him, even though he were in them only once a month. This would be a palpable evasion of the law, and yet the detestable system is carried on to a very large extent. Again, there is a second and quite a common case, where an unqualified person opens a druggist's shop and borrows for the sign-board and labels the name of a qualified pharmacist or even of a medical man, though the latter may have no connection whatever with the business, save perhaps that he draws a few pounds per annum for the use of his name! There is still a third case in which the law is being systematically evaded in certain parts of the country. A number of unqualified men form themselves into a company, open a shop, and employ a qualified assistant, whose name is printed on the labels, though he is in no sense the owner of the business, but simply the servant of the company; and while this is undoubtedly a violation of the spirit of the Act, the courts of law have decided that it is not out of harmony with its letter.

Fortunately, we here are free from any such equivocal methods of construing the Act; we do not ourselves indulge in the doubtful luxury of branch shops, nor are we harassed by the undue competition of unqualified traders. Not a prescription is dispensed in town save by one or other of the druggists, and enjoying, as we do, the confidence on the one hand of the medical profession, and on the other of the public, we may fairly conclude that we are quite as well off as most of our brethren, and that our lives have certainly not fallen to us in unpleasant places.

4. When the Act was passed the Pharmaceutical Society was appointed to carry out its provisions. Two classes of pharmacists are eligible for the membership of the Society, those who were in business before 1868 and those who pass the Major examination. All others, *i.e.*, those who pass the Minor examination, are eligible as associates, the practical difference between member and associate being that the former only can occupy positions of honour and responsibility in the Society. As a matter of fact the one is as good as the other in the eyes of the law, in so far as his ability to conduct a business is concerned. It has been found that relatively to the number who enter the profession, too few go up for the Major examination, and the inevitable result is, or will by-and-by be, that the governing body of the Society will be very much out of proportion to the remainder, who are already in a large majority. This certainly was not contemplated in 1868, the idea rather being that quite a large number would take the higher qualification. In this respect the framers of the Bill "reckoned without their host," as the percentage of Major passes has, during the past few years, been miserably small, and, therefore, it is clear that the Act requires amendment in so far as the constitution of the governing body is concerned.

If I have dwelt on some lengths on these points, it is only that you may be in a position to understand clearly the drift of a new Bill which has been framed by the Council of the Pharmaceutical Society, and is about to be introduced into Parliament, as well as any comments I may make concerning its provisions. Regarding these, the most diverse opinions have been expressed, but no more weighty utterances have been published than the addresses of Mr. Giles and Mr. Frazer delivered some six weeks ago, the one in London in defence (so far), the other in Glasgow in condemnation of the Bill. The former took up the position that the Bill is the logical conclusion of all our past efforts, and if we know our own minds, we are bound to hail it with delight and enthusiasm. Mr. Frazer, on the other hand, entered into a caustic criticism of what he seems to think is the culmination of a long series of errors, and urged that members should, at the Annual Meeting, demand its immediate withdrawal. It is somewhat difficult to understand how any two men can hold such diverse opinions on the same subject. Here are two leading pharmacists, equally high in the profession, both able and eloquent, both earnest and eager in their endeavours to promote the welfare of their brethren and their craft, and yet when a measure is brought forward with a view to the settlement of some disturbing questions in connection with the latter, we find the opinion of the one diametrically opposed to that of the other. This seems strange at first sight, but it ceases to be so when we remember that parallel cases may be found every day in our political, social, and even theological life. The curious thing is that in this instance the natural order is reversed. Mr. Giles seems to represent what I may call the Conservative side of pharmacy, yet he strongly advocates progress and reform, whilst Mr. Frazer, whose tendencies are of a distinctly Radical type, goes in as strongly for the *status quo*, forgetful, apparently, that—

> "Progress is nature's unexcepted law,
> Stagnation is an universal curse."

The Bill consists of twenty-three clauses, together with a schedule of poisonous articles, and without going into a separate examination of each clause, I shall briefly indicate the main features.

1. *Poisonous Articles.*—The previous Pharmacy Acts took cognizance only of "poisons," but this Bill introduces, in addition to these, a number of "poisonous articles." The appended schedule of these consists of sulphuric, hydrochloric, nitric and carbolic acids and butter of antimony. The Bill requires that each of these shall be labelled with its name, the word "poisonous," and the name and address of the seller. Their sale is not confined to pharmacists; any person may deal in them, provided they are duly labelled as above.

This provision seemed to me at first sight to be a mistake, but I find a difficulty in suggesting any change if we are not to allow matters to remain as they are. The safety of the public demands that something should be done with reference to these articles, and since the Privy Council has declined to place them in the list of scheduled poisons, the next best course is to take the utmost precautions possible in order to prevent calamitous accidents, and I am therefore compelled to conclude that the framers of this clause have really chosen the least of several evils.

2. *Patent Medicines.*—All patent medicines containing poisons within the meaning of the Pharmacy Act, 1868, must "be labelled with the name and address of the first seller, the name of the patent medicine and the word 'poison.'"

To most minds this would seem to embody, what I may call, a self-evident proposition, but there will no doubt be a few individuals who will, with the patent medicine proprietors, oppose it tooth and nail. Mr. Frazer is one of these exceptions, and though he has not a shred of argument to advance in support of his position, he is loud in his protest against what he calls the assimilation of our laws to those that obtain on the continent. For my part, I am of opinion that the time has now arrived when an effort should be made, in connection either with our own Bill or the Medical Bill, to "assimilate" at least to this extent, viz., to make it compulsory for all proprietors of patent medicines to publish the formulæ of such, or at all events to submit them to some authorized body.

Whilst I heartily agree with the principle of the clauses, I freely admit that the subject is a difficult one, and I certainly think that better means for recovering the penalties might be devised, as it is obvious that the process provided for in the Bill will render litigation exceedingly tedious, expensive and annoying. This portion of the Bill will probably not pass without alteration, more especially if the motion of which Mr. Sandford has given notice for the Annual Meeting receives anything like strong support. In the event of the Bill becoming law as it stands, I would not hesitate to label any patent medicine with the word "poison" should there be the slightest suspicion that the first seller was evading the law.

3. *Prescriptions.*—By the Act of 1868, the only articles of which the sale was confined to pharmacists, were poisons. The new Bill proposes to include physicians' prescriptions in this restriction, so that no one shall be allowed to dispense them, save properly qualified pharmacists, and also, of course, medical men.

In my opinion, the change here proposed is superfluous. At present we have comparatively little to complain of in this respect, and if the remainder of the Bill becomes law, there would be small chance of much harm to the public, seeing that the amount of illicit dispensing would be reduced to a minimum.

4. *Branch Shops.*—Every branch shop must be conducted by a duly qualified assistant.

Every keeper of an open shop shall be liable for his assistants and apprentices; the latter being deemed to be the agents of the seller on whose behalf the sale is made.

5. *Companies.*—The shareholders of companies keeping

open shops must, as proprietors of said shops, be duly qualified, failing which they are liable to a penalty. This is not stated in so many words, but is the meaning of the legal phraseology employed.

To all of these provisions I give my hearty assent, as they embody the principle of personal qualification, which the 1868 Act in some instances has failed to secure.

6. *Preliminary Examination.*—This must be passed previous to apprenticeship, and any pharmacist who shall take as an apprentice a person who has not so passed, shall be liable to a penalty. The Bill also seeks extended powers with reference to the other examinations, and in this connection I may say that the Council of the Pharmaceutical Society has resolved to require evidence of a regular curriculum of study at some recognized school or university from all candidates for the Minor examination after a certain date.

Generally speaking, this meets with my warmest approval and support. Some time ago I made a note of all the young men whom I have known personally in Hawick as apprentices. There were in all fourteen, not including those who are still here. Of these fourteen, two passed the necessary examinations and are now in business. Three are engaged as assistants, but have not yet passed the Preliminary examination, and one has emigrated. Of the remaining eight, one passed the Preliminary during apprenticeship, but owing to ill health took up another occupation; while the other seven who had not passed have each and all left what to them could never be anything but the "trade." Now these statistics point their own moral, and prove more conclusively than any amount of argument, the desirability, if not the absolute necessity of this provision. Had it been in force since 1868, all these young men would have required to attempt the Preliminary before apprenticeship. If they had failed there would have been an end of it, and some of their best years would have been spent in other walks of life; if they had passed (as most of them doubtless would), instead of 50 per cent. leaving the *trade* because they could never reach the *profession*, we would have had 50 per cent. of them fully qualified men. I somewhat fear, however, that the penalty clause will be found to be unworkable. A druggist who wished to evade it could do so with the utmost ease by simply making an arrangement whereby the apprentice would be styled the message boy, while on the other hand many conscientious pharmacists, who desire to do their duty towards their apprentices, but have a difficulty in obtaining them, will hardly thank the Legislature for hanging the sword over their heads in this fashion. The desired end would in most cases be obtained by adopting the recommendation made by the Council's Committee last year, viz., requiring three years' attendance in a shop after the Preliminary is passed, before the candidate is eligible for the Minor.

7. *Membership of Pharmaceutical Society.*—All chemists and druggists, as well as all pharmaceutical chemists, shall be eligible for membership of the Pharmaceutical Society; and further, every person who shall pass the qualifying examination after December 31, 1886, shall be entitled to be placed on the Register of Pharmaceutical Chemists.

As I have already indicated, the former of these provisions is rendered necessary on grounds of policy, and it is almost certain to meet with unanimous approval. The latter will tend to abolish in course of time the unnecessary distinctions among pharmacists, while it does not bind the Society not to have an honorary title should such be desired.

This completes the hurried review of the present aspect of things, and more especially of the Bill which every true pharmacist hopes soon to see on the statute book of the country, and there now only remains for me time to indicate in a sentence what, in my opinion, are likely to be the characteristic features of the pharmacy of the future.

In the first place, the pharmacy of the future will be in the hands of a uniform body of highly educated men, a statement the truth of which is so self-evident that I need not enlarge upon it. As a natural consequence, these men, by virtue of their higher education, will possess, more than this generation does, the confidence of the medical profession. For our part, we in Hawick are well off, as I have already shown, and the same remark may be applied to Scotch druggists generally; but things are different in many districts in England, where the druggists are regarded by the medical men with suspicion,—a suspicion, I fear, sometimes not unwarranted. This increase of confidence will have the effect of diminishing dispensing by the medical men, while the increase of education will tend to diminish prescribing by the druggists. It will generally be found to be the case that the pharmacists who know their own profession best, are least ready to intrude on the domain of the doctor; and so long as we have a class of druggists who have "a little learning," just so long will we have this "dangerous" system of counter prescribing pursued. It is an everyday experience of all of us that the man who pretends to know all about his neighbour's trade knows little about his own, while the converse is equally true. Again, the pharmacist of the future will, as an educated man, command the respect and confidence of the public, who rarely fail to know a genuine article when they see it.

All these conditions will, by a process of natural selection, inevitably tend to bring about a pure pharmacy, where there shall be no taint of the grocer, dry-salter, or oil and colour merchant. It is impossible to be perfect in two or three businesses at the same time, and the sooner a regular divorce is brought about, by which pharmacy will "come out from among them," the better will it be for all concerned. Finally, we shall have a great and united Pharmaceutical Society, truly representative of the educated pharmacists of the country. This will give pharmacy a position and power that it has never yet possessed, divided as it has been into several different parties, each of which has "its own hatchet to grind." It is only by uniformly raising the standard of education and qualification that all these sections can by-and-by be fused into one mass.

And now, perhaps, you will ask me what all this has to do with our Association? It has to do with it and with us to this extent, that it shows us we have a history behind us, and the possibilities of a great future in us. It is not for us, the "heirs of all the ages," to decline the responsibility which the present brings, and the remembrance of what has been done in the past will help to nerve us to do our duty in and for the future. This Association, if modestly carried on and kept faithfully in the lines laid down in its constitution, will do something towards bringing about the state of matters I have tried to depict; and even if its original members fail to see the ultimate triumph of the cause of progress and reform, they may rest assured that their labours will not have been in vain.

A vote of thanks having been accorded to Mr. Maben, on the motion of Mr. Dechan, seconded by Mr. J. A. Hislop,

Dr. Penman, on the invitation of the Chairman, expressed the pleasure with which he had listened to Mr. Maben's address. The medical men, he said, ought to be interested in a society of this nature, as they had to depend entirely on pharmacists for the proper treatment of their patients. He did not know much about dispensing, all that he had learned during a three months' course at a pharmaceutical chemist's having been to make a few seidlitz powders. He might say that in Hawick there was no dispensing done by the medical men, and he thought that the two things should be kept entirely separate. He was much pleased with the strong remarks made regarding patent medicines, and thought the Govern-

ment should insert in the Bill very strong provisions against the selling of these. Many diseases were caused and many were much aggravated by injudicious mothers giving these medicines to their children.

Mr. Maben, in reply, hoped that every member would try and do something to further the interest and usefulness of the Association. They should not go too far afield for subjects, but take those near at hand.

After a number of gentlemen had been proposed as honorary members and members, the Secretary intimated that the library would be opened on June 6, and that the next meeting of the Association would be held on June 12.

SHEFFIELD PHARMACEUTICAL AND CHEMICAL SOCIETY.

The ordinary monthly meeting was held in the Society's Room, Market Place, on Wednesday evening, May 9. In the absence of the President, the chair was taken by Mr. G. Carr, Vice-President, when a paper was read by Mr. E. R. Learoyd, entitled "Notes on the Organs of Vision."

Mr. Newsholme proposed, and Mr. Furness seconded, that the best thanks of the meeting be given to Mr. Learoyd for his interesting and valuable paper, which was carried unanimously.

MEETING OF CHEMISTS AND DRUGGISTS AT LEICESTER.

On Thursday, May 3, a meeting of the chemists of the town was held at the Masonic Hall, to discuss the proposed Pharmacy Bill.

Mr. W. Thirlby was voted to the chair, and in a few preliminary remarks, explained the reasons for calling the meeting and the nature of the business to be brought forward.

Mr. W. B. Clark then gave a very able *résumé* of the proposed Bill, calling special attention to the clauses dealing with the labelling patent medicines "poison," and the peculiar position a retailer would be placed in through any inadvertence on the part of the original vendor.

A long and interesting discussion ensued, and ultimately the following resolution was carried unanimously:—"That this meeting approves generally of the Pharmacy Act Amendment Bill, but specially wishes to point out that clause 4 may prove injurious to some proprietors of patent medicines, in cases where the quantity of poison in the whole package is very small."

A hearty vote of thanks to Mr. Clark for his paper, and to the Chairman for presiding, brought the meeting to a close.

Proceedings of Scientific Societies.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of this Association was held on Thursday, May 10, Mr. H. G. Greenish, Vice-President, in the chair.

Mr. H. S. Elworthy read a paper upon "Acetic Acid and its Derivatives," in which a detailed account of the constitution of acetic acid was given and also of its more important derivatives. The action of various reagents upon acetic acid was fully entered into, and the constitution and properties of the compounds thus produced were fully described.

A discussion followed the reading of the paper, in which the Chairman, Messrs. Baily, Cripps, Crow and Ranken took part.

A vote of thanks was passed to Mr. Elworthy.

Mr. R. A. Cripps, the Reporter upon Practical Pharmacy, then read some—

Notes on the United States Pharmacopœia.

This subject was treated botanically, pharmaceutically and chemically, the sources of official drugs being discussed, and the various chemical tests and pharmaceutical operations criticized. The chief points of interest in the Pharmacopœia were gone into, such as the preparation and composition of abstracts, fluid extracts, etc.; the use of glycerin in tinctures, fluid and solid extracts; the preparation of unofficial infusions, decoctions, etc., for which formulæ are given under the various series of preparations; and the use of oil of theobroma for suppositories instead of the B.P. basis. Observations were made upon the more important drugs, with special reference to the following:—Cinchona, conium, elaterin, balsam of Peru, citrate of iron and quinine, aloes, digitalis, jalap and asafœtida. The paper also included the following:—

Note on the Estimation of Water in Carbolic Acid.

The United States Pharmacopœia states that if a definite volume of carbolic acid be mixed with an equal volume of chloroform the water will rise to the surface and will represent the percentage of water present.

The following experiments were made with the object of determining the value of this test.

1. A solution of carbolic acid was made containing 20 per cent. of water. 450 parts by volume of this were taken and mixed with 450 parts of chloroform. On standing till the water had completely separated (which was about sixteen hours) only 63 parts were obtained, corresponding to 14 per cent. of water.

2. One hundred parts of 50 per cent. carbolic acid were shaken with 100 parts of chloroform and yielded 44 parts of water, corresponding to 44 per cent.

3. Ninety-five parts of carbolic acid were mixed with 5 parts of water and 100 parts of chloroform added and well shaken; a perfectly clear liquid resulted, with not the least separation of water.

4. The same experiment was repeated, using carbolic acid containing 8 per cent. of water; a clear solution resulted, from which no water separated after fourteen hours.

The addition of a very small quantity of water to the last solution caused a cloudiness, and after a time the separation of about ·5 per cent. of water.

From these experiments it will be seen that the method is quite useless, an acid containing as much as 8 per cent. of water being passed as pure.

In the discussion that followed, the Chairman, Secretary, Messrs. Crow, Ranken and Ransom took part, after which the meeting adjourned.

Parliamentary and Law Proceedings.

Poisoning by Laudanum.

On Tuesday an inquest was held by Mr. Hawkes, Birmingham borough coroner, at his court, Moor Street, on the body of Margaret Mycock, aged 54 years.

The deceased's daughter said for the past three months her mother had suffered from bronchitis and rheumatics, and could not sleep at night. Last Friday night deceased directed witness to fetch her a pennyworth of paregoric and a pennyworth of laudanum, which she drank. Witness had fetched the same kind of poison for her on two previous occasions, and about two months ago she purchased some from Mr. William Henry Reedman, chemist, of 404, Monument Road. When she obtained it she was not asked either her name or residence, neither did she sign any book. Witness did not tell the chemist what she wanted it for.

The Coroner: Do you mean to say that you, a perfect

stranger, go to a chemist's where you are not known, and there purchase a pennyworth of laudanum and a pennyworth of paregoric without being asked anything about it?—Yes, sir.

And the chemist puts a poison label upon the bottle. Is that what you mean to say?—Yes, sir.

Last Friday you went again to the shop, and got another bottleful.—Yes, sir.

Witness added that she put the contents of the bottle into some water, and deceased drank it at about 10 o'clock the same night. Deceased took the same quantity when it was bought for her two months before. In half-an-hour after that she went into her room and found that deceased was unconscious. From that time to the time when the doctor came she did not regain consciousness. They made no effort to get a doctor during the night, because they thought she was sleeping.

Evidence of a similar character was given by one of the sons of the deceased, who also stated that deceased's friends would be entitled to about £11 4*s.* from an insurance office in consequence of her death.

Mr. Leech said he had attended the deceased in April last, when she was suffering from bronchitis, Bright's disease and rheumatism. When he saw her at about 1 o'clock on Saturday morning she was in a state of coma. Altogether she had taken 6½ grains of opium, which was therefore dangerous. He endeavoured to restore animation, but failed, and deceased died shortly after 2 o'clock. He did not think, even if prompt means had been taken, that she would have lived, because of her diseased condition.

Mr. Reedman, the chemist from whose shop the poison was purchased, said the laudanum and paregoric were served by his assistant. He had conformed to the Act regulating the sale of such drugs by putting a label on the bottle stating that it contained poison.

The Coroner said he simply wished to know whether there had been any irregularity in the selling of the poison.

The Coroner summed up, and the Jury returned a verdict "That death had been caused through misadventure."—*Birmingham Daily Post.*

Review.

NOTES AND STATISTICS OF CINCHONA BARK. By JOHN HAMILTON. London: J. W. Collings.

This little pamphlet of seventeen pages professes to give rough statistics of the importation of cinchona bark into some of the leading European countries and into the United States. The compilation of tables of statistics might appear, at first sight, to be an easy matter; but there are so many possible sources of error, and so many difficulties in the way of obtaining information, that the author may be congratulated upon being able to obtain even rough statistics on so complicated a subject as the commerce of cinchona bark. Mr. Hamilton has evidently taken much pains to collect reliable information, yet he has been unable to obtain any account from Spain and Austria; from the latter country because all importations of drugs are classed under one heading. There must naturally be much difficulty in making divergent accounts from different sources agree, and hence it can hardly be wondered at, that the statements on page 6, of the amount of cinchona bark exported in 1881 from England to France and the United States does not agree with that of the quantity imported from England in the same year by those countries, on pages 10 and 11. This is more especially the case when one is at the mercy of printers. Thus in a foot-note on page 6, Mr. Hamilton remarks that he received the following reply anent the Table A, when making inquiries as to the difference between statements obtained from the Board of Trade and others published in the *Ceylon Observer*:—

"The Board of Trade monthly accounts only give approximate quantities and value; the great difference in the values of 1878 arises from a printer's error in the monthly accounts."

Nevertheless tabular statements are always of considerable value, if even only approximately correct, and must of necessity afford abundant food for reflection. Thus the conclusion is arrived at that England is the chief market of the world for cinchona bark, and the value of its importations is shown to have increased from £218,565 in 1870 to £1,816,501 in 1881. Although more than half of the imports are again sent out of the country the value of the exports is less than that of the portion retained, indicating that the best cinchona barks remain in Great Britain. It is also an instructive fact that the value of the imports of East Indian Barks has increased from £22,682 in 1876 to £248,894 in 1881.

Comparatively little is said concerning the West Indian barks, these having only entered into commerce within the last few years. There could, however, be no difficulty in obtaining information from Jamaica under the present active administration of the Botanical Department. So far as can be gathered from the tables, it would appear that most of these barks find a market in the United States.

Another singular fact revealed by these statistics is the speculation which takes place in the cinchona market. The variation in the price of quinine, of which 6*s.* 6*d.* in 1875 and 13*s.* in 1878 may be taken as examples, has led to frequent interchanges of bark where least expected. Thus England has imported cinchona bark from France and Germany, although it has sent back in the same year more than it received. America also has imported cinchona bark from twenty-eight different countries, instead of only from those which produce it.

It is interesting to note also that while the Java bark received in Amsterdam in 1881 amounted to only 268,540 lbs., in the same year 1,864,912 lbs. of East Indian bark was imported into the United Kingdom. The care taken in the cultivation indirectly comes out in the fact that the Java *Ledgeriana* bark has steadily increased in percentage of quinine from the maximum percentage of 5·48 in 1872 to 9·00 in 1881. There are many other important facts and much useful information afforded by this little *brochure*, which should be in the hands of every one connected with the cinchona trade.

It may be hoped that in a second edition the author will be able to add some tables of the respective values of the different varieties of cinchona barks, such as would give to planters same idea as to the species which would pay best in cultivation, and as to the country which would afford the best market for special varieties.

Obituary.

Notice has been received of the death of the following:—

On the 5th of April, Mr. Felix Padman Hubbard, Chemist and Druggist, Walsall.

On the 23rd of April, Mr. Richard Morgan Evans, Chemist and Druggist, Porth, Rhondda Valley. Aged 39 years.

On the 23rd of April, Mr. William Walpole, Chemist and Druggist, White Lion Opening, Great Yarmouth. Aged 75 years.

On the 24th of April, Mr. John Maitland, Pharmaceutical Chemist, Chester Place, Hyde Park Square, W. Mr. Maitland was one of the Founders of the Pharmaceutical Society.

BOOKS RECEIVED.

KOMMENTAR ZUR ZWEITEN AUFLAGE DER PHARMACOPŒA GERMANICA, nebst Uebersetzung des Textes sowie einer Anleitung zur Massanalyse. Zum praktischen Gebrauche bearbeitet von O. SCHLICKUM. Leipzig: Gunther. 1883. From the Publisher.

PROCEEDINGS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION AT THE THIRTIETH ANNUAL MEETING. Philadelphia: 1883. From the Association.

ADDRESS ON THE TREATMENT OF PULMONARY CONSUMPTION, with a Note of a Visit to Davos-Platz. By Dr. M'CALL ANDERSON. Glasgow: Maclehose and Sons. 1883.

DISEASE AND PUTRESCENT AIR. By THOMAS ROWAN. London: E. and F. N. Spon. 1883.

DISPENSATORY OF THE UNITED STATES. By Dr. GEO. B. WOOD and Dr. FRANKLIN BACHE. Fifteenth edition, re-arranged, thoroughly revised and largely rewritten. By H. C. WOOD, M.D.; JOSEPH P. REMINGTON, Ph.G.; and SAMUEL P. SADTLER, Ph.D., F.C.S. Philadelphia and London: Lippincott and Co. 1883. From the Publishers.

MATERIA MEDICA. A Manual for the Use of Students. By ISAMBARD OWEN, M.D. London: J. and A. Churchill. 1883. From the Publishers.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

THE PROFESSORS AND THE PHARMACOPŒIA.

Sir,—So far as I know, our own and similar corporations cannot afford to, and do not retain the whole of the time and services of professors. That being so, our Council, in expecting our Professors to announce an engagement with the Medical Council, expected what might amount to disloyalty to the latter Council, a fault which the long services of our Professors forbid us to assume they possess.

As to any unofficial intimation of their appointment, not only have we now their own statement that they were not at liberty to mention it, but I hear on indisputable authority, that for ordinary business reasons, unconnected with pharmacy, the editors were requested not to anticipate the Medical Council in the announcement.

The anger of Mr. Schacht, the sadness of Mr. Hampson, and the *non-sequiturs* of Mr. Symes may be disregarded; but I am sure that Mr. Young and others at the last Pharmaceutical Council Meeting, would not have said what they did, had Mr. Greenish, in reading what he termed the words of the Report of the Pharmacopœia Committee, read the whole of those words, those in which the Medical Council state that they will themselves communicate with the Pharmaceutical Council. Besides, personal charges by our Council against those they employ should be made in committee, and with reasonable opportunity for defence, and only published, if at all, after the most rigid scrutiny.

I think an apology is due to our Professors for this publication of such ill-founded defamatory censure.

We are, in my opinion, distinctly nearer to pharmaceutical representation on the Pharmacopœia Committee than when no pharmaceutical officer was editor, and nearer than when only one pharmaceutical professor and one other expert were editors. Let us be careful to avoid alienating by unjustifiable reflections the goodwill of three pharmaceutical officers of the Pharmacopœia Committee who have shown that they sympathize with our aspirations as regards pharmaceutical representation on that Committee, and whose loyalty to the Pharmaceutical Society is shown by all their public acts during the past twenty to forty years.

It would have struck me that not only the Council, but the whole of our body of all grades, would have been jubilant at the appointment of our Professors to these offices or functions, an appointment shedding indirect recognition of our claims for fair consideration in this important national work.

280, *Walworth Road, S.E.* WM. FRED. SMITH.

Sir,—When we consider the nature of the work which has to be performed in compiling a new edition of the Pharmacopœia, and the important interests which chemists have at stake while the chains which, in future, are to fetter them are being forged, it is not surprising that a neglect upon the part of the Medical Council to provide due representation upon the Revision Committee should cause a feeling in our ranks somewhat akin to indignation.

The advantage of employing Professor Redwood as Scientific Editor of a new edition of the Pharmacopœia was demonstrated very clearly in the issue of 1867 by comparison with the original British Pharmacopœia of 1864. Consequently, no one can be surprised that the Medical Council should seek to follow up so manifest an advantage by adding the remaining two Professors connected with our school to his staff. Such a course is obviously necessary to prevent a repetition of the unscientific blunders contained in the original edition, and to render the new one as perfect as possible in the present stage of scientific advance; and every chemist will heartily welcome this well-deserved recognition of our able Professors' merits. But surely it is unjust to stop there, for it was fondly hoped that the time had now arrived when the position of the legally qualified chemist would be recognized fully, in that he being engaged in applying his knowledge in a practical form upon the various preparations contained in the Pharmacopœia was indispensable as the element of actual experience in any future Committee of Revision which was formed under a new Act of Parliament.

The question is, Have chemists an interest in the Pharmacopœia? It would be idle to contend for a moment that they had not. If so, it must follow that the only way to secure legitimate interest is by adequate representation. And I venture to ask my fellow chemists "Are they satisfied to be represented by the Professors of our school only?" I will yield to no one in my appreciation of the gentlemen to whom, personally, I owe so much, but I refuse to admit for one moment that such an established body as is represented by the Pharmaceutical Society has received fair play at the hands of the Medical Council by their appointment, especially as it seems to me to have been effected behind the backs of its representatives. I was pleased to see the letter signed by the Professors repudiating any share in the transaction prejudicial to the Society's interests, and, I honestly believe, notwithstanding that in my humble judgment it would have been better for those interests if the Pharmaceutical Council had been made aware of the negotiations while they were being conducted, that our Professors would not in any way knowingly compromise the least of our interests, for it would be a poor compliment to their past labours if after all their years of pupilage no greater advance could be granted to their pass men than merely to stand on one side and see them do the work. What a future! What a relation to exist between Pharmacy and the State!

But I am thankful to see from the discussion which took place at our last Council that this matter is not to be allowed to drift, and that prompt measures will be taken to assert our claims. Let us country members also do our share and further the petitions to the utmost of our ability, for if we fail, pharmacy will sink from her position of handmaid to become the very slave of the medical profession.

Mardol, Shrewsbury. W. GOWEN CROSS.

"*Edina.*"—(1) *Chrysosplenium oppositifolium*; (2) *Anemone nemorosa*; (3) *Luzula sylvatica*; (4) *Doronicum Pardalianches*, probably: send it when in flower.

J. E. S.—The preparation appears to be a proprietary one, and we do not know that the formula has been published.

O. R.—No, he cannot do so legally.

G. F. Cock.—A little mucilage of acacia added before the liq. quin. ammon. will keep the alkaloid suspended in a minutely divided condition.

COMMUNICATIONS, LETTERS, etc., have been received from Messrs. Deck, Newsholme, Southall, Stark, Pharmacist, Inquirer, Rheim, Quercus, and Querist.

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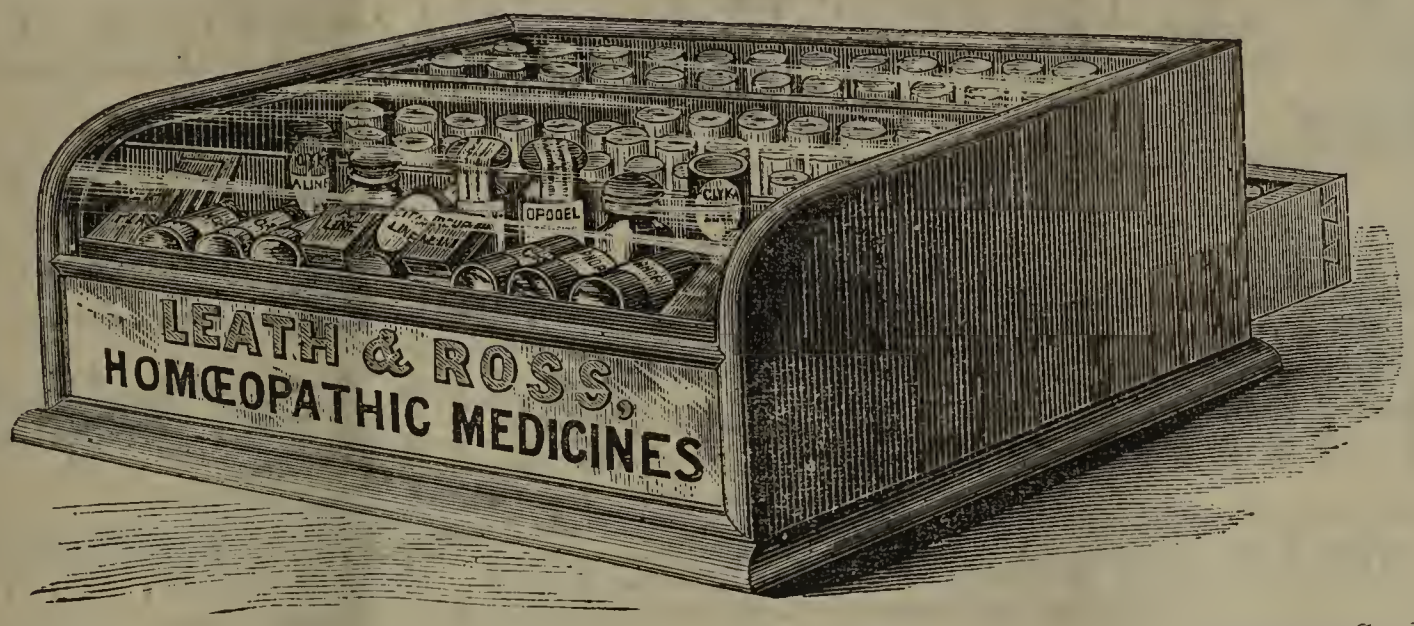

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See PHARM. JOURN., *March* 10, 1883.

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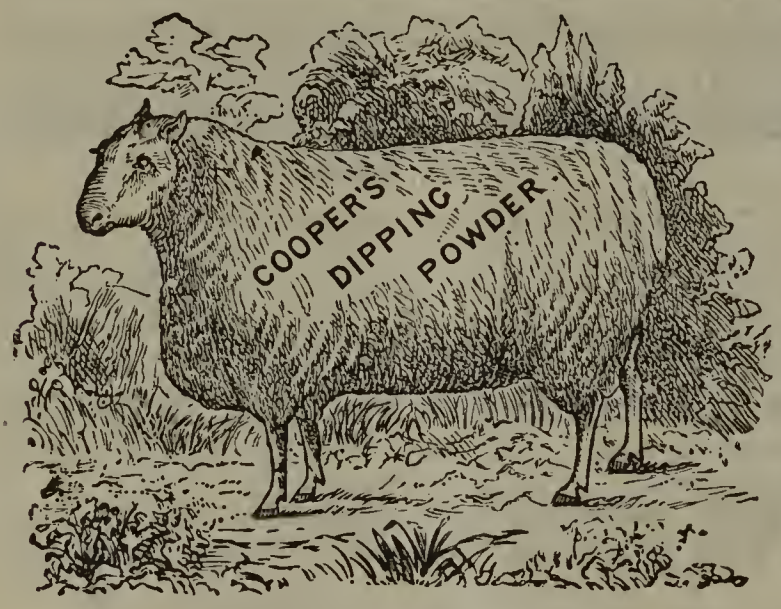
See Chemist and Druggist, January last, page 33.



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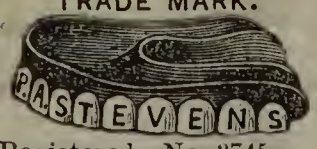

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OF

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To the June Examination ... ... £3 3s.
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At the Pharmaceutical Examinations held last month, the following students of this College were successful :—

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* SMITH, W. T.

MINOR.

* BADCOCK, H. D.
BANBURY, R.
BARLOW, G.
CARTER, W.
CORDER, W. S.
CURNOW, W. A.
* CUNNINGHAM, O. W.
CODLING, A. J.
* DULLEY, D.
* DUNBAR, G.
* EDWARDS, R. W.
ELSTOB, JNO.
* GEORGE, I.
HEPPLE, T.
HILL, J.
HORNE, C.
* JEANS, A.
* KING, A.
* MIDGLEY, W.
MAY, S. A.
MALLETT, J. T.
* PEARSON, W. J.
* RAWLINGS, W. J.
* ROBERTS, A. H.
* TROAKE, C. F.
* WALKER, G. J.
WOOD, E. J.

PRELIMINARY.

ANDREWS, E. A. | LETHEREN, E. J.
* WOOD, A.

APOTHECARIES' HALL.

* WILSON, D. W. R.
* CUNNINGHAM, O. W.
* BADCOCK, H. D.
* CROFTS, J. E.
* OWEN, D. J.
BECK, P. C.
* KING, A.
* HALTON, J. H.
WILSON, H.

* These Gentlemen were resident students.

The next Session will commence on Monday, September 3rd.

Students desiring to enter the School at the commencement of the Twelfth Session, on 3rd September, should send in their names without delay, as the few remaining benches in the Laboratory are being rapidly filled up. The regular course is three months, but those already possessing knowledge may enter at any time when there is room.

FEES.

MAJOR OR MINOR.

October Examination ... ... £5 5s.
December ,, ... £8 8s.
Six Months' Course ... ... £10 10s.

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Messrs. WILLS & WOOTTON,
TRINITY SQUARE, LONDON, S.E.

THE

CENTRAL SCHOOL OF CHEMISTRY & PHARMACY

Laboratory and School Buildings:

173, MARYLEBONE ROAD, N.W.

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Mr. LEVETT | Mr. STEPHENSON
Mr. TOWNSEND

MINOR.

Mr. BISHOP | Mr. PAINTER
,, CHATTAWAY | ,, STEVENS
,, HARRISON | ,, TAYLOR
,, GRADIDGE | ,, WILLOUGHBY
,, HAYNES | ,, WILSON

Candidates wishing to present themselves for the June or July examinations should at once apply for particulars to Messrs. LUFF & WOODLAND, 173, Marylebone Rd., N.W.

"SYSTEMA OMNIA VINCIT."

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325, KENNINGTON ROAD, S.E.

Director: Dr. JOHN MUTER, M.A., F.I.C., F.C.S., &c.

FOURTEENTH SESSION, 1882-3.

A few benches remain for the 3rd B Course, which commenced April 14th. Fees, Syllabus, &c., apply to W. BAXTER, Secretary.

PRIVATE TUTOR

Mr. JAS. W. SAUNDERS
(From the Royal School of Mines),
130, CAMDEN ROAD, N.W.

SIX of my Students presented themselves at the April Minor, **FOUR** passed—all at their first attempt. Those wishing to attend my "practical demonstrations" for the June or July Minor are requested to apply, as my few vacancies are fast filling. **PERSONAL TEACHING. NO DEMONSTRATORS.** Postal Instruction. Enclose stamp for particulars; or "at home" daily from 1.30 to 2.30.

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AS ASSISTANT. Age 23. Minor qualification. Good references. CORTEX, 6, The Struet, Brecon.

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ASSISTANT, speaking German, French and English, with thorough knowledge of the respective pharmacies, wishes engagement in London or provinces. References irreproachable. MOECHEL, premier élève, Pharmacie Rogers, Paris.

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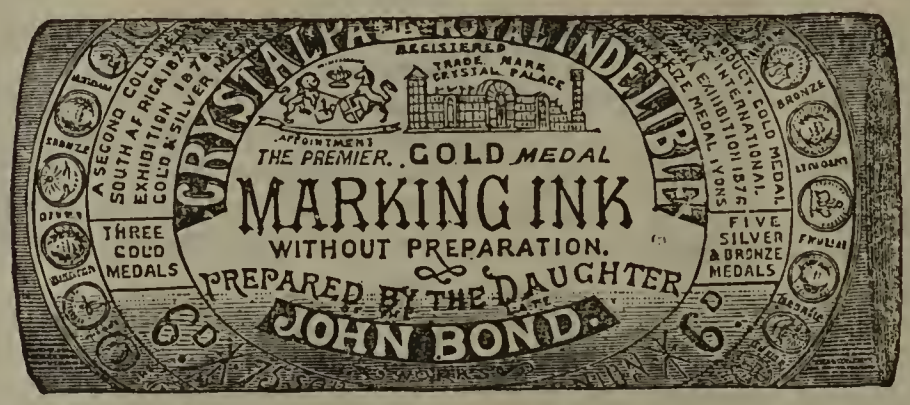

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The Pharmaceutical Journal AND Transactions.

THIRD SERIES, No. 674.] SATURDAY, MAY 26, 1883. [PRICE FOURPENCE.

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Pharmaceutical Society of Great Britain,

17, BLOOMSBURY SQUARE, LONDON.

ELIAS BREMRIDGE, Secretary and Registrar.

NOTICES.

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TWO SCHOLARSHIPS are offered annually, and come into operation at the commencement of the Session in October. Candidates for these Scholarships must be Apprentices or Students of the Pharmaceutical Society, under twenty-two years of age, and have passed not less, or been engaged not less, than three years in the pharmacy of a Registered Pharmaceutical Chemist or Chemist and Druggist.

Each Scholarship is of the annual value of thirty pounds, and is to be held for one year. In addition to the Endowment, the Council provide free Laboratory instruction and admission to the lectures to the holders of the Bell Scholarships; and books of the value of five pounds, given by Mr. T. H. Hills, are divided equally between them.

The examination for these Scholarships takes place on the first Tuesday in July. Candidates desiring to compete must send notice to the Secretary, accompanied by Certificates of age and testimonials from their previous Employers or Masters as to capability, industry, and general conduct, on or before the first day of June.

Further particulars can be had on applying to the Secretary, 17, Bloomsbury Square.

* A scholar is supposed to be *commencing* his studies, or at least to have made only that progress which may be reasonably looked for during an apprenticeship. The object of the examination is to ascertain that the candidate has such an amount of ability, and affords evidence of having made such use of it in the acquirement of elementary knowledge, as will justify the expectation of his proving a successful student who may do credit to the appointment, and become a useful and accomplished member of the pharmaceutical body.

MAJOR, MINOR AND MODIFIED EXAMINATIONS.

The Board of Examiners for England and Wales meets at 17, Bloomsbury Square, London, in February, April, June, July, October, and December, and the Board of Examiners for Scotland meets at 119A, George Street, Edinburgh, in January, April, July, and October, for the purpose of conducting the above Examinations. Candidates must give notice to the Registrar in London, and pay the fee on or before the *first* day of the month in which the Examinations are held. Each candidate for the Major and Minor Examinations must, at the time of giving notice, produce a Registrar's Certificate of Birth, and a certified declaration that for three years he has been registered and employed as an Apprentice or Student, or has otherwise for three years been practically engaged in the translating and dispensing of prescriptions. Printed forms of declaration may be obtained from the Registrar in London. Each Candidate for the Modified Examination must state the number of the receipt for his declaration and his age at the time of giving notice.

Candidates will receive notice of the date on which they will be required to present themselves.

In the practical portion of the Major Examination standard works of reference are provided for the use of Candidates at the discretion of the Examiner. No other books or memoranda are allowed.

SPECIAL NOTE.

Each Candidate must state, at the time of giving notice, whether he desires to be examined in London or in Edinburgh.

PRELIMINARY EXAMINATION.

This Examination will be held throughout Great Britain, at 12 o'clock at noon, on the first **Tuesdays** in January, April, July, and October. Candidates must give notice to the Registrar on a printed form of application, to be obtained from him, and pay the Fee, not less than *fourteen* days prior to that on which the examination is to be held.

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OF THE

Pharmaceutical Society of Great Britain.

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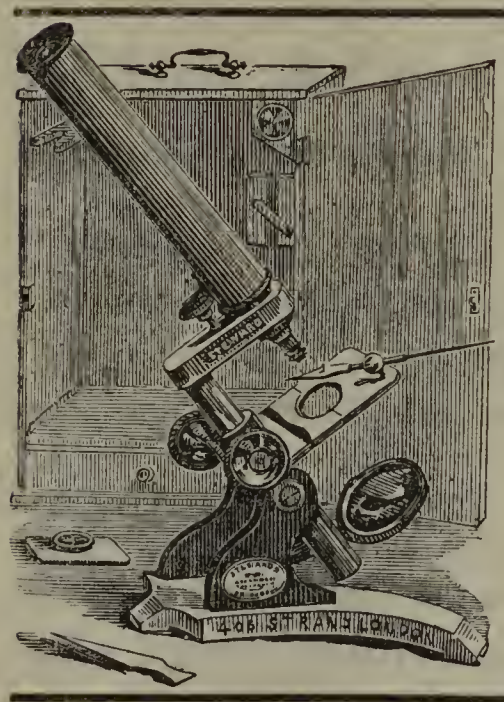

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This preparation, which has now been well tried by many hundreds of medical men, was introduced by us about two years since, to supply a want that was felt, and thus obtain a reliable and active preparation of Ergot. Perhaps there is no drug of which we hear such contradictory results as to its action and use. Several things may fully account for this ; the inertia of the drug employed, the dose administered, and the manner and the time of giving it. Various preparations, such as the Liquid Extract of the *British Pharmacopœia*, many of the ammoniated liquid extracts, the stale powder, and the tincture, are inert, or nearly so. Heat is said to be destructive in preparing the drug, though this may be doubted by many old practitioners who have, from time immemorial, been in the habit of making at the bedside an infusion from the powder or the beans. Being satisfied that there was real cause for the numerous complaints as to the uncertainty of the various preparations used by medical practitioners, we have succeeded, after many experiments, in obtaining a pure liquid extract, which, we are glad to say, has given immense satisfaction to the accoucheur, and in general practice, in the various diseases that the drug is indicated, and which are considered *seriatim*.

Liq. Ergotæ Purif. (Hewlett's) can be administered with effect :—

1st.—In tedious labours, where the pains are infrequent and of no force, and where the os is dilated, and when the uterus is becoming exhausted, one or two drachms of the Liq. Ergotæ Purif. (Hewlett) given in a little water excites powerful and continued contractions of the uterus. 2nd.—In post-partum hæmorrhage, Liq. Ergotæ Purif. (Hewlett) administered in half to one drachm doses is very conspicuous in its action in arresting the bleeding, by producing firm contraction of the uterus, and by its influence on the blood-vessels in diminishing their calibre. When the patient is reduced almost to a hopeless state, the dose may be increased and repeated every hour or two if necessary. 3rd.—It has been given with success on the Continent, in that troublesome class of cases following enlargement of the prostrate gland, as it causes diminution of its substance by its peculiar action on involuntary muscular fibre, and it has been lately prescribed with marked benefit in cases of diabetes insipidus, in diminishing the amount of urine.

Packed in 5-oz., 10-oz., 22-oz., 40-oz. and 90-oz. Bottles. Price 10s. 6d. per lb. Specially prepared by C. J. HEWLETT & SON, Operative Chemists, 40, 41, and 42, Charlotte Street, London, E.C.

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	Gloves. (Pairs.)	Straps.	Pads.
CALEFACIO OR BADEN, No. 1, soft Brown ... per doz.	6/4	10/8	6/0
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CALEFACIO (the **U.S.**), striped soft Brown ... per doz.	6/8	11/4	6/0
HONEYCOMB, white ...per doz.	5/4	10/8	5/6
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Ditto BEST QUALITY ... ... ,, 5/- ,, ,, 5/6

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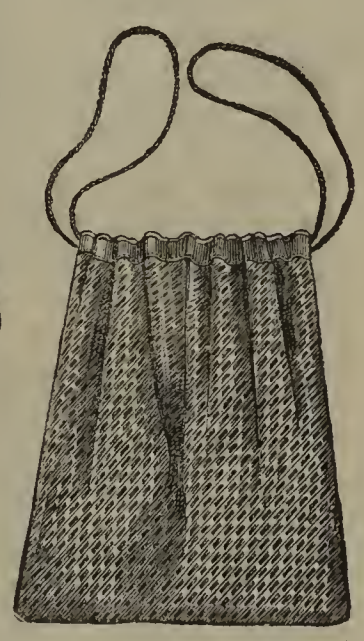

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WITH BALL CLASP FASTENINGS, NICKEL PLATED.

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This Salt has been most extensively used as a remedy for sick headache, and with such great success, that it may almost be called a specific. It relieves all disorders of nerve-function, and is at the same time most cooling and refreshing.

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(Signed)

JOHN ATTFIELD.

London, Dec. 6, 1881.

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Any formulæ dispensed and covered, and samples, with list of pills, from 500 different forms, which are kept in stock, will be forwarded free on application.

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We strongly recommend our Aperient Pills as a good general saleable Pill. These, with the Pharmacopœia Pills quoted below, are sent out to every part of the United Kingdom in half-pound parcels, package, postage, and carriage free, on the same day as the order is received; and, to avoid booking and other expenses, 1*d.* in the Shilling will be allowed if Stamps or P.O.O. are remitted with order.

Our Pills can also be obtained from any Wholesale Druggist. In ordering, please specify "Cox's Tasteless Pills."

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		Coated.	Uncoated.
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3 & 4	,, ,, (Cox) sine Cal..	6/	5/
193	,, Cathartic Fort. (Cox).	6/	5/
332	,, Cochia	5/	4/
	Pills of the British Pharmacopœia.		
6	Pil. Aloes. Barb.	6/	5/
8	,, ,, et Asafœtidæ....	5/	4/
9	,, ,, et Ferri	5/	4/
10	,, ,, et Myrrh.	12/	11/
7	,, ,, Soc.	6/6	5/6

No. in Catalogue	Pills of the British Pharmacopœia.	Prices per Pound in Four or Five Grain Pills.	
		Coated.	Uncoated.
122	Pil. Asafœtidæ Co.	6/6	5/6
66	,, Cambog. Co.	6/	5/
24	,, Coloc. Co.....	16/	15/
30	,, ,, et Hyos.	13/	12/
62	,, Ferri Carb.	5/	4/
71	,, Hydrarg.	5/	4/
92	,, ,, Subchlor Co.	6/6	5/6
77	,, Ipecac. c. Scillæ.....	7/	6/
90	,, Plumbi. c. Opio.	12/	11/
104	,, Rhei Co.	7/	6/
119	,, Saponis Co.	12/	11/
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The Registrar of Trade Marks (after giving the usual public notice, prescribed by Parliament, to allow of opposition) has granted us the above "Trade Mark," thus officially recognising us as the "*Original Makers of Tasteless Pills*," and no Pills will be sent out without this Mark on all bottles or packages.

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Have an immense sale, both at home and abroad; will keep in any climate, and give universal satisfaction.

Put up in Tins, containing 3 dozen, 6 dozen, or 12 dozen 1d. Cakes.

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CAUTION.—The large demand for our specialities has caused systematic imitations. Messrs. Mackey are the inventors and sole makers of Mackeys' Genuine Quinquinine and Mistura Bismuthi Comp., and any imitation is illegal and calculated to mislead the purchaser. The trade is earnestly requested, if not ordering direct, to give special prominence to the word MACKEYS', *e.g.*, Mackeys' Quinquinine; Mackeys' Mist. Bismuthi Co.; Mackeys' Chlorodyne, all soluble Compounds of Cerium, and improved preparations of the Hypophosphites.

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Mackey, Mackey & Co. supply the following preparations of Cerium:—(By Royal Letters Patent.)—LIQUOR CERII, Sedative-Tonic. LIQUOR CERII CUM PEPSINA, Tonic-Digestive. MISTURA CERII COMP., Tonic, Stomachic, and Anti-Dyspeptic.

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MACKEYS' MIST. BISMUTHI COMP.—Tonic-Digestive. Dose 15 to 30 minims. The only reliable preparation of Bismuth. Contains Bismuth in its most effective form, combined with Chloroform, Nux Vomica, Hydrocyanic Acid, with or without Morphia. A valuable remedy for various forms of indigestion, and any disorder of the stomach, in pyrosis and other internal malignant diseases. It is prescribed with success for infantile diarrhœa.

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CURES ALL KINDS OF CUTS, BRUISES AND WOUNDS IN MAN AND ANIMALS.

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2.—The words "Prepared only by his Widow" in RED INK across labels.

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Manufactured only by AIMÉE LLOYD (Widow of A. S. LLOYD).

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LIME-FRUIT JUICE CORDIALS.

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London, April, 1883.

(Signed) EDMUND STURGE.

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Conroy's Malt Coffee has received the following Certificates amongst many others.

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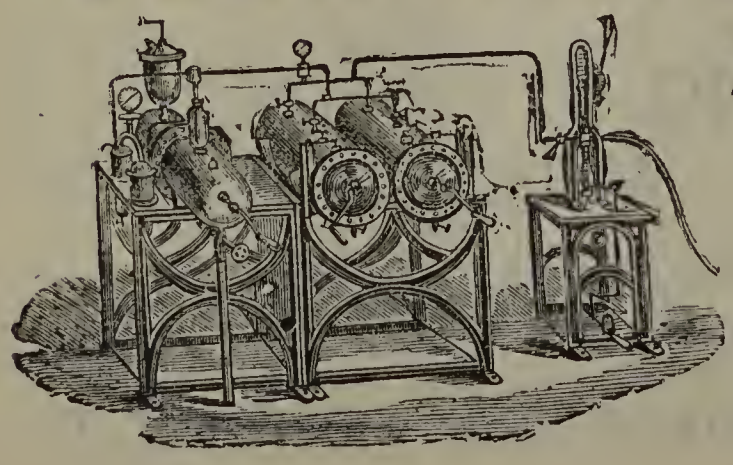

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EACH fluid drachm contains 34.4 grains of Iodide of Iron.

ONE volume added to seven volumes of *Syrupus, B.P.*, forms Syr. Ferri Iodidi of full Pharmacopœia strength.

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EACH fluid drachm contains 4 grains of Phosphate of Iron, 4 grains of Phosphate of Quinia, and $\frac{1}{8}$ grain of Strychnia.

ONE volume added to three volumes of *Syrupus, B.P.*, forms Easton's Syrup.

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EACH fluid drachm contains 8 grains of anhydrous Calcium Phosphate combined with Lactic Acid.

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LIQUOR Ferri Phosph.

EACH fluid drachm contains 8 grains of Ferrous Phosphate.

ONE volume added to seven volumes of *Syrupus, B.P.*, forms Syr. Ferri Phosph.

LIQUOR Ferri Phosph. Comp.

EACH fluid drachm contains, in addition to the alkaline Phosphates, 4 grains of Phosphate of Iron, and 8 grains of Phosphate of Calcium, dissolved in pure Phosphoric Acid.

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THE ANNUAL DINNER.

The Annual Dinner of the members of the Pharmaceutical Society and their friends was held on Tuesday Evening, at Willis's Rooms, St. James's, and was very numerously attended. Thanks, however, to the introduction of the electric light, in the incandescent form, in the chandeliers, the temperature of the banqueting-hall was appreciably lower than attendants at this festival had been accustomed to. The Chair was occupied by Mr. Michael Carteighe, President of the Society.

Grace having been sung—

The PRESIDENT proposed "The Health of the Queen," which was drunk with the usual loyal enthusiasm; as was also

The next toast, "The Prince and Princess of Wales, and the rest of the Royal Family."

The third toast was rather an innovation at these meetings, being "The Houses of Parliament," proposed by the PRESIDENT, who remarked that it was generally understood that in those elevated regions there was so much time spent in talking that there was very little left for thinking. As speaking, therefore, was essentially the function of members of the House of Commons, he would leave the speaking to the gentleman whose name he would couple with the toast—Mr. McCullagh Torrens.

MR. MCCULLAGH TORRENS, M.P., said it was but seldom that any gentleman who had the honour of responding to such a toast addressed such a truly representative assembly as the one he saw before him. He felt the responsibility which attached to him as a member of the House of Commons, but he must say that increasing years and experience in Parliament in no way led him to wish that that sense of responsibility should be lessened. On the contrary, he felt the responsibility of his position more and more, and never lost the opportunity of seeking counsel and advice from those with whom he came in contact as to the due discharge of the duties which devolved upon him as a member of the Legislature. Measures of great importance to the public interest were constantly coming forward, and he understood that the House of Commons would shortly be asked to discuss in the interests of the medical profession and the public at large a new Medical Bill, to which he had felt it his duty to give some attention. He must say he was somewhat struck in reading over its clauses to find that no mention was made of the body which he now had the honour of addressing, and especially with regard to the preparation of the Pharmacopœia, which, it seemed to him, ought to be a *résumé* of the advancement of science in that particular department, and that unless it were so it must fall behind the requirements of the day. In the preparation of the Pharmacopœia it seemed to him that pharmacists were specially interested, and were specially qualified to take part; and he could only say that in the House of Commons they never ventured on an opinion on any scientific question without calling in the assistance of experts and practical men. He understood that some petitions would be presented in connection with this matter; and though petitions might be lightly esteemed by some people, he would remind them that though the weight of a snowflake was almost inappreciable, the effects of a snowstorm were by no means to be despised.

The PRESIDENT next proposed "The Lord Mayor, the Sheriffs and the Corporation of London." He said he had been informed that this toast ought properly to have been divided, as the Sheriffs represented the county; but by the gracious permission of the Lord Mayor and the Sheriffs, the two toasts would be proposed as one. Some of the earliest combinations of Englishmen for self-protection were to be found in the ancient city of London, and in very early times the great guilds united either to assist the Sovereign or in some cases to resist his encroachment. He would prefer, however, as a pharmacist whose occupation was a very sedentary one, to speak of the great benefits which had been conferred on the whole of greater London in recent times by the Corporation, in being the means of preserving open spaces around the metropolis. The man who after long confinement wanted to feel the turf under his feet, could go to Epping Forest, or Burnham Beeches, or Coulsdon Common, or some other place which had been preserved to the public by the public spirit of the Corporation. He might remind his country friends, who were not so directly interested in these local matters, that the people of London were solely indebted to the public spirit and liberality of this great Corporation for the opportunities they had of enjoying these open spaces; and for this reason, if for no other, he had no doubt the toast would be received with acclamation.

The LORD MAYOR, in responding said, after some few months of experience, he had come to the conclusion that wherever the Lord Mayor happened to show his face, it was expected that the sound of his voice should be heard. He only wished that he could find something fresh to say, but his ideas were naturally led in the direction of the company he had the honour to address, and probably a large section of those he saw before him would expect him to give them a long dissertation on the qualities of certain drugs, and the effects which might be obtained by the admixture of certain essences. He feared, however, if he trespassed on the ground be should be somewhat in the position of the little girl who, when her companion said they had had rhubarb pie and that the rhubarb was grown in her own garden, replied that she also had had rhubarb pie, but that her's came from Turkey. Another section might expect him to enter into a learned dissertation on the art of surgery, and that he would unveil the whole mystery of taking the human heart from the body, cleansing it from all impurities, and setting it to work. But he did not propose to trouble his hearers with either of these subjects, though he was quite convinced that if a Lord Mayor was expected to do so he should have to do it. Only a few weeks since he had the pleasure of dining with the Royal Academy, and there, in returning thanks for the same toast, he had to call attention to the fact that the first Royal Academy owed its existence to the fostering care of the Corporation of London. The Paper Stainers' Company constituted the first Royal Academy, and all the great painters of the time were freemen of that Company, and from that Company at last the Royal Academy was established. It was something similar with regard to the Pharmaceutical Society, which might be said to have owed its origin to the Apothecaries' Company of London. When that body began to practise medicine it was found necsssary that there should be a real Pharmaceutical Society, and hence one was established. The President had been good enough to refer to

the past history of the Corporation; he would not presume to go into that subject, for if he did the time at his disposal would not enable him to deal with anything like all the good works it had performed. With regard to the preservation of open spaces, though some of these were a considerable distance from the metropolis, they felt that they were legislating for posterity, and that the time would come when those who came after them would bless the old Corporation of London for having in its foresight taken care to secure those places for their use which, though now far removed, would then be surrounded by the busy haunts of men.

Mr. Sheriff SAVORY in responding, said the Lord Mayor had responded for the ancient corporations, but the institution which he represented was far more ancient. Being a company of pharmacists who were accustomed to follow their motto, "*Habenda ratio valetudinis*," they would understand the blessings of health and would not expect him to make a long after-dinner speech. If, however, it were necessary to show the connection between the sheriffs and the Society it would not be difficult to do so. The sheriffs of London and Middlesex were two pharmacists, inasmuch as they maintained law and order, which contributed more than anything else to the health and welfare of any state or city. It was not necessary for him to refer to the well-known maxim, *Salus populi suprema est lex*, to prove that the welfare of the people must always depend on the maintenance of that order which the sheriffs were appointed to secure.

The VICE-PRESIDENT, in proposing "The Health of the Learned Scientific Societies," said the historian of the nineteenth century would remark one thing particularly, that in the latter half of it there was no lack of scientific research. He would notice the extraordinary activity in scientific investigation which was one of its principal features. In past ages there had been many remarkable men, great geniuses, who had struck out original paths, such as Galileo, Newton, and, in later days, Darwin and Pasteur; but the great contrast between the past and the present was this: the great thinkers of the past threw out their ideas on somewhat barren soil, inasmuch as there were no scientific societies to take part in them, and in many cases they were long years before their ages, and often had to suffer ostracism from the orthodox of society. But in our own day, no sooner did Darwin suggest his great thought of evolution, or Pasteur that of life from germs, but immediately a Tyndall, a Huxley, and a host of eminent workers took up these great thoughts and worked them out in manifold forms. There was not an atom of matter in the heavens above, or in the earth beneath, or in the waters under the earth, that science did not investigate. If there was a trace of ead in Saturn, or the slightest smell of sulphur about Mars, or the faintest possible tinge of tender emotion in Venus, the scientific chemists would immediately show it in delicate colours by spectroscopic investigation. Savants went forth as challengers to the deep, deep sea, and called upon it to yield up its secrets. All this was not simply for the dignity of man, or to ennoble his reason, or to grace his home, but it had a strictly utilitarian aspect. Except the highest form of moral science, there was nothing in the world which had done so much for man as science. By the lessening of human pain and suffering, they showed the truest form of the international and the wisest form of communism; and in all these matters pharmacists were deeply interested. They claimed to be most anxious and interested observers of the work of scientific men; and he was quite confident the toast would be well received, especially as he had leave to couple with it the name of a gentleman of very great eminence in original research, one of the Past-Presidents of the Chemical Society and the present President of the Institute of Chemistry, Dr. Odling.

Dr. ODLING, F.R.S., said if he felt incapable of replying adequately to the toast which had been proposed in such flattering terms he should only confess a feeling which men far more worthy than himself would feel if placed in a similar position. He spoke in the presence of a past president of the British Association, and he must say that to respond adequately he should have to embody the substance of five presidential addresses, and even then he should fall short of the subject. He ought indeed to trouble them not only with five past addresses, but with the quintessence of the addresses of the fifty-two past presidents of the Association, and further to derive from his inner consciousness what the fifty next presidents were likely to say; he must, therefore, withdraw from a task which he felt to be insurmountable, and content himself with replying in a modest way to the good feeling which had been expressed by the Vice-President. Speaking with all seriousness it did seem to him that in a large gathering like that it was not unfit that there should be some recognition of the mutual ties and obligations which subsisted between the learned societies, whose fundamental aim was the advancement of human knowledge, and bodies like the Pharmaceutical Society and the Institute of Chemistry, of which he was the unworthy president; bodies which were devoted mainly, though not exclusively, to the professional applications of knowledge. He might remimd them of some words of wisdom spoken by Sir William Siemens at Southampton, in which, after paying a just tribute to the scientific few who devoted themselves exclusively to the investigation of scientific principles, he observed that our great advances in science, and the civilization which resulted from science, nevertheless depended on the exertions of the much larger classes of persons whose efforts brought them daily more and more into union, and tended to fuse them into one body. He referred to scientific men who, like his distinguished friend Sir Frederick Abel, did not think it beneath them to apply their excellent abilities to the solutions of practical questions, and on the other hand to the busy men of practice who did not disdain to devote a portion of their time to the investigation of scientific problems. Among this last class he need scarcely say the Pharmaceutical Society justly claimed to have furnished a by no means inconsiderable contingent, regard being had either to numbers or eminence. The Royal Society enrolled amongst its members many distinguished practising members of the Pharmaceutical Society, and the Linnean Society and the Chemical Society also found amongst them some of their most esteemed and active colleagues. In connection with this idea of the association of busy men with scientific pursuits he might refer for a moment or two to the association which existed between the Pharmaceutical Society and the Institute of Chemistry. He sometimes heard it said that the golden days of pharmacy were past and that pharmacy was a declining profession, although judging

from the brilliant gathering that evening no one could for a moment believe that these expressions could have a substantial foundation. Nevertheless, they were told that there was a pharmaceutical depression as there was an agricultural depression, that the prospects of pharmacy were by no means brilliant, and that the pharmacist, if he wished to hold his own in the race for life, must with the agriculturist wander into fresh fields and pastures new. He did not believe this was the case, but however that might be he could only say that the prospects of professional chemistry were not declining; they were advancing, and in view of the association which subsisted between the two bodies, and in which they recognized the Pharmaceutical Society as their elder brother—though they did not quite acquiesce in its claim to be sole legal proprietor of the title of chemist—at the same time he would say to pharmacists that if their prospects were declining there was no reason why they should not advance their professional prospects. In every town throughout the kingdom there was an increasing demand for professional chemical aid, and it became a question whether the young men entering the pharmaceutical profession might not also have an eye to the chemical profession, and of qualifying themselves and becoming associates in the Institute of Chemistry. However this might be, it was gratifying to recognize the harmony which existed between the two bodies who, he had no doubt, would in the future go forward hand in hand to promote the great cause which they both had at heart.

The PRESIDENT next proposed the toast of "The Medical Profession," the noble profession with which they were daily and hourly brought in contact, a profession which required for its exercise an enormous amount of self-denial. Some pharmacists were apt to complain of the way in which they were daily and hourly at the public call, and thought they were the hardest worked and worst paid body in existence. He should be sorry to dispel the pleasant illusion, but he thought the medical profession had a claim to priority in that respect. After long years of study and patient practice, the medical man had to submit to an amount of selfishness on the part of the British public to which no other profession would for a moment submit. In addition to this self-abnegation, most practising physicians had some branch of science to which they were attached, and on which they contributed original researches, often worked out late at night or early in the morning, and which did not often bring in the pecuniary reward that such labour would produce in other occupations. Pharmacists, being more associated with the medical profession than most people, were better able to judge of these matters than the outside public, and were, therefore, prepared to welcome them at such gatherings, to drink their health and wish them good speed, not only in the particular art which they practised, but also in those original researches by which they added to the sum of knowledge. He would couple with the toast the name of a member of the profession who had not only distinguished himself in the treatment of disease, but who years ago and up to the present time was regarded by biologists as one of the most eminent of his class—Sir Joseph Fayrer, President of the Medical Society of London. He had been long known as a diligent worker in biological science, and he had much pleasure in congratulating him on the position he had attained.

Sir JOSEPH FAYRER, C.S.I., F.R.S., in responding, said the physician and the pharmacist were very old allies. They had both, since the practice of medicine began, been engaged in the struggle which was going on, and ever must go on, with disease and suffering, and also in efforts which ameliorate the condition of life. It was only right that medical men should freely declare how much their branch of the profession owed to pharmacists for the success they had obtained, and it was a very pleasing feature of the present day to see the great strides which both physiology and pharmacy were making. He hoped their success might be as great in the future as it had been in the past.

Dr. FARQUHARSON, M.P., next proposed "Prosperity to the Pharmaceutical Society, and the Health of the President." On some occasions he was able to pose as a politician; but on this occasion he should prefer to pose as a member of the medical profession, and as one who endeavoured, however humbly, to instruct pupils at one of the metropolitan hospitals in pharmacy and therapeutics, which those whom he addressed worked at so successfully every day. He need not say anything farther on the mutual relations of the pharmacist and the doctor. That Society was known in many ways, it was well known by the gathering they were all looking forward to next evening as one of the events of the London season; it was also known by its annual dinner and also by the excellent Museum to which so many in his profession were glad to go occasionally to refresh their memories, but it was much more widely known as the great educational medium which was so widely spreading over the country men who by their beneficent acts and accuracy of prescribing and in a great number of other ways were doing good and faithful service to the public. Again, in scientific research, he had only to mention the names of one or two distinguished men who had passed through its rooms in former days. He would only refer to the honoured names of Hanbury, Bell, Squire and Attfield, or of a gentleman, whom, not to know, was to argue yourself unknown, Thomas Hyde Hills. He could not sit down, however, without saying that in addition to the toast of the Pharmaceutical Society, he had to propose "The Health of the Chairman, Mr. Carteighe." They all knew what his distinguished position had been in the past, and what was his present scientific status, and he could only hope that he would live many years to keep up the dignity of the Society over which he so worthily presided.

The PRESIDENT, whilst thanking Dr. Farquharson for the very complimentary manner in which he had proposed this toast, felt bound to say that he regarded it purely as an official toast, and as a recognition of what had been done in pharmacy by those who had preceded him in that chair. He remembered a celebrated cartoon which appeared in *Punch* many years ago, when a distinguished member of the Conservative party, Mr. Disraeli, was described as having stolen the clothes of the Whigs while they were bathing, and he feared he was very much in that position, having reaped the reward earned by his predecessors. He felt he did not deserve personally the complimentary terms which had been employed, but on behalf of the Society which he repre-

sented he thanked Dr. Farquharson for them, and if as a Society they did not deserve those compliments now, he hoped they would all continue to work until such time as they did. Their desire was to aid the physician in the cure of the sick, for the benefit of the public, and to advance the knowledge of the great art by which human suffering could be reduced and human lives preserved. Pharmacists were all anxious to assist in that great work, and if in the smallest degree that Society succeeded, its existence was amply justified.

The PRESIDENT then proposed the last toast, "Our Guests," coupled with the name of Sir Frederick Abel. They had amongst them many gentlemen of reputation, both in medicine and science, and amongst these gentlemen who had laboured for many years in the cause of pure science, and in the applications of that science to many useful arts, none had been more successful than the gentleman whose name he associated with the toast. Some might think it very improper for a distinguished man to devote his knowledge to an examination of explosives and things of that kind, but on the general principle that to be well armed was to be well prepared, if you wished to preserve the peace of the world, it appeared to him that such a course was perfectly justified. At any rate, he might say how sincerely they congratulated Sir Frederick on the honours which his Sovereign had lately bestowed on him, and how thoroughly they all felt that those honours were deserved. To their many other guests he wished, on the part of the Society, to express his grateful acknowledgments for their kindness in coming amongst them, and he was sorry that from want of time he could not ask them all to respond to the toast.

Sir FREDERICK ABEL, F.R.S., said it was indeed an honour that the President should have selected him from amongst the many guests whom the Society had invited that evening, but it was a still greater honour that his name had been so cordially received. It had been his privilege and pleasure to be the guest of the Society on several occasions, and in several different functions, as President of the Chemical Society and as the predecessor of Professor Odling at the Institute of Chemistry. It had been his duty and pleasure to address meetings certainly not more numerous than that, and on several occasions it had been his special pleasure to speak from his heart with regard to the important functions performed by the Society so splendidly represented that evening. He could not in making himself a mouthpiece of the various guests do better than say that the various members of the different professions whom he saw round him, and the different learned and scientific societies, felt especially honoured in being connected,—a connection which increased in intimacy year by year,—with so useful a body as he had the honour of addressing. It had been his pleasure to be associated with the President in working out the details of younger societies, and they had profited in no small degree by the wisdom which had been accumulated in years past by this Society, and he hoped that in the future the same thing might take place.

The PRESIDENT then called on Dr. Andrew Clark to respond for their medical guests.

Dr. ANDREW CLARK said there was no explanation to be given to the inconsistency of human nature. When he entered the room that evening he did so with the intention of enjoying himself, and that feeling was heightened by knowing that he would not have to reply to any toast. He hated after-dinner speaking, and nothing would have induced him to break the resolution never to speak after dinner if he could help it but one thing, and that was that he felt that in all that had been said that evening not anything like justice had been done to the Pharmaceutical Society of Great Britain. For twenty-eight years he had been practising medicine and he felt that in the practice of the art of medicine there was a great guild of medicine, every element and person of which was related one to the other, and if they did not uphold each other and do the best they could for each other no good would come of it. Instead of Mr. President and Gentlemen, he would say Brethren of the great guild of medicine, which had for its business of all sorts and classes the relief of human suffering and the prolongation of human life. That evening had been very pleasant to him in many ways, and in none more than when he heard one speaker speak of the great functions which the Pharmaceutical Society bore in the important business of the relief of human suffering. He had noticed since he had been in practice that there had been a steadily growing attention to accuracy, minuteness and fidelity in the work of dispensing prescriptions. It might be said that that was a small thing, a mechanical thing. But it was not a mechanical thing; he held that if a great body such as that was could with one mind come together and say, This is the work we have to do, we shall do it to the letter and in the spirit as well, it would not end there. It was not merely doing a thing accurately and well which would benefit them; it might benefit them in a certain mechanical and pecuniary sense; but it also benefited them in a higher sense, in a sense which the Pharmaceutical Society of Great Britain ought to feel, a sense which should animate them all to take their proper position in the social scale—it was that in every work they did it should be a real and true work, and that every faculty they could bring to bear upon it should be brought to bear, and in so doing they would lift up their whole nature. He would only say that if they accustomed themselves to do the smallest act, to make up the pettiest prescription, with the highest idea of perfect accuracy and loyalty, they did a good thing; and it did not end with the idea of doing a good thing, but the repetition of that good thing made in them a nature, a purpose, a feeling, a habit, which would lift up not only the individual, but every member of the Society, and thereby justified them in rising to the station they ought to occupy in the social organization. He as a practising doctor had seen and recognized gratefully the assistance which he had derived from members of that Society, often rendered at great inconvenience, and every member of the medical profession appreciated it. The knowledge they possessed entitled them to a higher position than they had yet occupied. This was very pleasant to say; but there was one thing he had to say which was not so pleasant, one thing which would prevent them, if they did not stop it, from occupying the position they ought to hold in the social scheme. There was rising up amongst the chemists of this country a tendency to bring forward special remedies, secret remedies, to advertise them, and to take all sorts of indirect means of pushing them. The result of that was that it made one or two excessively or undesirably rich, while it injured the whole body. If they took his advice they would not allow any man who did such a thing to hold a place of honour in the pharmaceutical organization. They should have all their work clear, open, straightforward, honest as the day, and then nothing could hinder it. If they did that, they might depend upon it that, like the medical profession—which was their analogue—they would take their just position, which they had not yet reached, in society.

The musical arrangements were under the direction of Mr. Winn, and a selection of part-songs and solos was sung at intervals during the evening with great effect.

The Pharmaceutical Journal.

SATURDAY, MAY 26, 1883.

Communications for the Editorial department of the Journal, books for review, etc. should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE ANNUAL MEETING.

THE number of pages in the present Journal devoted to the Report of the Proceedings at the Annual Meeting of the Pharmaceutical Society on Wednesday last, whilst rendering unnecessary in these columns more than a reference in general terms to what took place, will bear evidence to a satisfactory amount of interest taken by the Members and Associates of the Society in the management of its affairs. Many gentlemen present had travelled long distances in order to attend this meeting, and during nearly five hours the topics mentioned in the Annual Report were discussed with unflagging energy and, except in respect to one subject, with a practically unanimous endorsement of the action of the outgoing Council. In commencing the proceedings the President departed somewhat from the usual custom, and, instead of delivering a formal address, he gave an able exposition of and running commentary upon the different subjects mentioned in the Report. In order to save time and prevent unnecessary confusion of topics it was agreed that all reference to the subject of the clauses in the draft Bill relating to the penalty for selling patent medicines containing poisons without proper labelling, upon which Mr. SANDFORD had given notice of his intention to propose a resolution, should be deferred until the report of the Council had been disposed of. After the adoption of the Report had been moved by the President and seconded by the Vice-President, an amendment was moved by Mr. VIZER, but as the discussion which followed was necessarily discursive it may be convenient to follow pretty closely the order adopted by the Chairman in treating the principal topics.

In the first place the President referred to the subject of the finances of the Society, and especially to the decision as to changing the mode of investment of part of the capital of the Society by laying it out in freehold ground rents. In defence of this change he argued that corporations, not being hampered, like individuals, with the necessity for realizing the largest possible returns during the limit of a lifetime, should consider what was best for the future welfare of the body, and he hinted that the time might come when, as one result of the new departure, what has recently been termed "unearned increment" might render it possible to carry on the business of the Society without calling on the members for subscriptions. Mr. FRAZER, however, pleaded the "canniness" of a Scotchman as not allowing him to view the change in quite so favourable a light, and Mr. SANDFORD protested strongly against the innovation, which he foresaw would involve an army of collectors and, perhaps, of decorators.

Another subject upon which the President enlarged, and to which several subsequent speakers referred, was the revision of the Pharmacopœia. After detailing the steps taken by the Council to utilize the opportunity afforded by the introduction into Parliament of the Medical Acts Amendment Bill, he pointed out that the question to be discussed was not the appointment of editors and assistants, or the conduct of individuals, but whether pharmacists should not have the legal right of being represented on the Pharmacopœia Committee by members of their own body competent to see that experts and others did not make suggestions that were impracticable for British pharmacists. With the exception of Mr. FRAZER, who looks upon the Pharmacopœia as simply the physicians' prescription book, this view was indorsed heartily by every speaker who referred to the subject. Mr. GILES, especially, in an able speech, pointed out that in 1809, when the apothecaries had not yet attained the legal recognition as medical practitioners afterwards accorded to them by the Act of 1815, they were represented on the committee that drew up the London Pharmacopœia. At the time of the passing of the Medical Act of 1858 apothecaries had already ceased to represent pharmacy proper, but pharmacists were then too recently organized to put forward an effective claim to take their place on the Pharmacopœia Committee. Now, however, that the Pharmaceutical Society has been in existence more than forty years this disability has ceased, and to stop short of attaining this position he considered would be a dereliction of duty towards the republic of pharmacy. That the Society does not yet enjoy a more satisfactory recognition in respect to the revision of the Pharmacopœia Mr. GILES attributed to the lowering of its *personnel* from various causes, and also to the calibre of the Council of to-day not being equal to what it was or ought to be, an expression of opinion that roused a considerable amount of dissent. As will be seen by the report on p. 963 the subject of Pharmacopœia revision had already been under the consideration of the Council that morning, on the occasion of the receipt of a printed memorandum, enclosed in a transferred note from the Registrar of the Medical Council. We understand that similar applications for suggestions have been received by many pharmaceutical associations and individual pharmacists in different parts of the country, and we presume that as soon as a Pharmacopœia com-

mittee is constituted in which pharmacy is properly represented they will willingly render it all the assistance that lies in their power.

Another point in the Report that requires to be mentioned, because it formed the subject of an amendment, is the epitome of the curriculum scheme. Mr. VIZER moved that the third and fourth recommendations should be modified by reducing from three to two years the time to be spent in a pharmacy after passing the Preliminary examination before going up for the first part of the qualifying examination, shortening the interval between the two parts of the qualifying examination from twelve to six months, and allowing the student to pass through a portion of his curriculum during the period of his apprenticeship. The object of the amendment was to enable a person to become registered, if he so desired, within three years of passing the Preliminary examination; but it obtained scarcely any support, and, as pointed out by Mr. MARTINDALE, if the person had commenced his pharmaceutical career before he was eighteen years of age, he would still have to wait until he was twenty-one before he could become registered. Indeed there were some decided expressions of opinion that a compulsory apprenticeship of four or even five years would not be too long. Mr. BLAND entered a vigorous protest against the institution of a curriculum and the encyclopædic character of the syllabus, as being out of proportion with any privileges enjoyed by the registered chemist and druggist. From Scotland, too, there came an objection to the enforcement of the passing of the Preliminary examination before apprenticeship, Mr. PATERSON alleging that it would exclude a class of lads from whom a large number of apprentices are now drawn in that country. The feeling of the meeting was, however, manifestly in favour of the recommendations of the Council, and after rejecting Mr. VIZER'S amendment, and another to the effect that no change in the educational arrangements should at present be made, the Report was adopted *nem. con.*

Mr. SANDFORD then moved the resolution of which he had given notice, expressing the objection of the meeting to the provisions in the fourth, fifth and sixth clauses of the draft Bill, under which the seller would be rendered liable for payment of any penalty for a sale of a patent medicine containing a scheduled poison. Mr. SANDFORD maintained that the action for the recovery of the penalty should lie directly against the proprietor or importer of the article, and enlarged upon the hardship of imposing upon the seller responsibilities in respect to the sale of preparations of the composition of which he knew nothing. On the other hand, the President described the difficulties that would attend attempts to proceed directly against proprietors who might not reside in the country, or importers, and pointed out that the right of recovery, which the retail seller would have against the person from whom he bought the goods, would make the wholesale dealer very careful to satisfy himself as to the nature of a proprietary article before introducing it to the retailer. Mr. SANDFORD'S arguments, however, found favour with the meeting, and notwithstanding a suggestion to refer the subject for re-consideration to the incoming Council, the motion was carried by a small majority.

We have the pleasure of being able to state that the two *réunions* which have now become almost an integral part of the Annual Meeting of the Pharmaceutical Society have this year been even more than usually successful. At the Dinner of the Members of the Pharmaceutical Society and their friends, at Willis's Rooms, on Tuesday last, the company numbered about two hundred and twenty, and included pharmacists from all parts of the country. Among the guests were the Right Hon. the Lord Mayor, Mr. Alderman and Sheriff De Keyser, Mr. Sheriff Savory, the President of the Society of Chemical Industry (Sir F. Abel), the President of the Medical Society (Sir Joseph Fayrer), the President of the Metropolitan Branch of the British Medical Association (Dr. T. Bridgwater), the President of the Clinical Society (Dr. Andrew Clark), the President of the Obstetrical Society (Dr. Gervis), the President of the Odontological Society (Dr. Walker), the President of the Harveian Society (Dr. E. Symes Thompson), the President of the Institute of Chemistry (Professor Odling), the Master of the Society of Apothecaries, Dr. Farquharson, M.P., W. McCullogh Torrens, Esq., M.P., Professor Allman, W. T. Thiselton Dyer, Esq., Dr. Langdon Down, Wyndham Cottle, Esq., and Dr. T. Stretch Dowse.

* * *

On Wednesday evening, by the kind permission of the Lords of the Committee of Council on Education, the Annual Conversazione of the Pharmaceutical Society was held in the South Kensington Museum. Upwards of two thousand five hundred ladies and gentlemen responded on this occasion to the invitation of the President and Council, amongst whom were the Right Honourable the Lord Mayor and the Lady Mayoress, Mr. Alderman and Sheriff De Keyser and Mrs. De Keyser, and Mr. Sheriff Savory and Mrs. Savory. The company were received in the Architectural Court by the President and Mrs. Carteighe, the Vice-President and Mrs. Atkins, the Treasurer and Mrs. Robbins, and the other Members of the Council, most of whom were accompanied by ladies.

* * *

We understand that several communications have been addressed to the Secretary in reference to the circular issued on behalf of the Pharmacopœia Committee of the Medical General Council, asking for information on the subject. From the nature of these communications, and some of the replies that have already been addressed to the Medical Council, there is good reason to believe that those most capable of rendering the assistance asked for consider that the request should have been made through the medium of the Pharmaceutical Society. Indeed, as a fair expression of the feeling on the subject, we may refer to a letter from Mr. T. B. Groves, of Weymouth, who says he will be very pleased to render all the assistance in his power towards perfecting the new edition of the British Pharmacopœia, "when requested by the pharmaceutical authority, *i.e.*, the Pharmaceutical Society of Great Britain," of which he is a member.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL.

Wednesday, May 23, 1883.

MR. MICHAEL CARTEIGHE, PRESIDENT.

MR. SAMUEL RALPH ATKINS, VICE-PRESIDENT.

Present—Messrs. Andrews, Borland, Bottle, Butt, Churchill, Gostling, Greenish, Hampson, Hills, Radley, Richardson, Robbins, Savage, Schacht, Symes and Williams.

Portrait of Mr. Squire.

The President drew attention to a portrait of Mr. Peter Squire, which had been kindly presented to the Society by Mr. J. E. Mayall, and on his motion, seconded by the Vice-President, a cordial vote of thanks was passed to Mr. Mayall for his gift.

Pharmacopœia Revision.

The President read the following circular which had been addressed to the President and Council. He also mentioned that a similar application had been addressed to him individually, and he understood that a considerable number had been issued to pharmaceutical associations and individual pharmacists throughout the country.

"General Medical Council Office,
"299, Oxford Street, London, W.
"*May* 18th, 1883.

"Sir,—I am directed to forward you the enclosed 'memorandum' in reference to a new edition of the 'British Pharmacopœia' and to express the hope that you will, at your early convenience, favour me with an answer to be submitted to the Pharmacopœia Committee.

"I am, Sir,
"Your obedient servant,
"W. J. C. Miller,
"*Registrar.*

"The President of the
"Pharmaceutical Society of Great Britain."

"General Council of Medical Education and
"Registration of the United Kingdom,
"299, Oxford Street, London, W.
"*May* 18, 1883.

"*Memorandum.*

"The General Medical Council, having decided on issuing a new edition of the British Pharmacopœia, have appointed a Committee to make the necessary arrangemenns for carrying this object into effect under the direction of the Council.

"In the performance of this duty the Committee are desirous of enlisting the co-operation of the several medical and pharmaceutical authorities, and of such persons as may be able to furnish useful information, with the view of rendering the work as complete and accurate as possible. In furtherance of this object the Committee invite, and will be happy to receive such suggestions as may be made to them by the above named authorities, and to give these suggestions their most attentive consideration.

(Signed) "Richard Quain, M.D.,
"*Chairman of the Pharmacopœia Committee.*

"To the President and Council of the
"Pharmaceutical Society of Great Britain."

The consideration of a reply to this circular was deferred.

Several former Members, Associates and Apprentices were restored to their status in the Society on payment of the current year's subscription and a fine.

A copy of the following Memorial to the Privy Council on the subject of Pharmacopœia Revision was laid on the table:—

"*Memorial of the Council of the Pharmaceutical Society of Great Britain to Her Majesty's Privy Council.*

"Medical Acts Amendment Bill.

"The Council of the Pharmaceutical Society of Great Britain begs to call the attention of the Privy Council to the provisions of this Act relating to the preparation and revision of the British Pharmacopœia (clauses 60 to 63, page 35 of the Bill).

"According to the provisions of the Bill, this work is to be published under the direction of the Medical Council.

"For the purpose of compiling and revising the Pharmacopœia previous to its publication, it has always been found necessary to appoint a special Pharmacopœia Committee.

"In this country, hitherto, that Committee has consisted solely of members of the Medical Council, assisted by professional experts, whereas in all other European countries, the constitution of that Committee is fixed by law, and in every case it includes a considerable number of pharmaceutical chemists. In the United States of America, pharmaceutical chemists form a majority of the Committee of Revision.

"The decision as to what drugs or medicines shall be introduced into or expunged from the Pharmacopœia rests with the medical members of the Committee, and the responsibility as to the working out of the chemistry and pharmacy of the preparations, and the manner in which they should be made, rests with the pharmaceutical members.

"The Council of this Society considers that this or some such method should be followed in this country, and laid down in the Bill now in the House of Commons It is supported in this view by many members of the medical profession and by the medical press generally. Moreover, inasmuch as by the Pharmacy Act, 1868, and the Sale of Food and Drugs Act, the Pharmacopœia is taken as the standard of purity and strength of such drugs and medicines as are contained therein, it seems desirable and equitable in the public interest that the practical experience of pharmaceutical chemists should be made available on the said Committee.

"Since the time when the apothecaries commenced to practise medicine, pharmacy has been more and more neglected by medical practitioners and the medical licensing bodies; whereas the Pharmaceutical Society of Great Britain, since its incorporation by Royal Charter in 1843, has occupied the position abandoned by the Apothecaries, and continuously directed its efforts to the improvement and extension of those special branches of knowledge on which pharmacy proper is based. In 1852, Parliament recognized the public ultility of the Society's exertions by passing the Pharmacy Act, 1852, on the ground that it is expedient for the safety of the public that persons exercising the business or calling of pharmaceutical chemists should possess a competent practical knowledge of pharmaceutical and general chemistry and other branches of useful knowledge.

"Since the value of the Pharmacopœia as a legal standard depends very much on the loyalty with which pharmaceutical chemists and chemists and druggists conform to its instructions, it seems politic to associate members of the pharmaceutical body with the representatives of the medical profession on the Committee.

"The Council of the Pharmaceutical Society of Great Britain therefore ventures to suggest that a clause to the following effect be inserted in the Bill after clause 63:—

"'For the purpose of compiling the said Pharmacopœia there shall be established a Pharmacopœia Committee consisting of six medical practitioners, to be nominated by the Medical Council, and five pharma-

ceutical chemists, four to be nominated by the Council of the Pharmaceutical Society of Great Britain (one of the four to be resident in Scotland) and one by the Council of the Pharmaceutical Society of Ireland.'"

The Council then adjourned to the Annual General Meeting.

FORTY-SECOND ANNUAL GENERAL MEETING.

The Forty-second Annual General Meeting of the Members and Associates in Business of the Society was held on Wednesday, the 23rd inst.

The PRESIDENT took the chair at twelve o'clock.

The SECRETARY having read the notice convening the meeting, it was agreed that the Report should be taken as read.

THE ANNUAL REPORT.

From the financial statement it will be seen that the income of the Society for the year 1882 exceeded the expenditure by £1297 3*s.* 1*d.* The gross receipts from subscribing members, associates, and apprentices are somewhat less than in the previous year, the deficiency being principally due to a reduction in the number of members, while the income from the class of associates shows a steady and progressive increase. Examination fees have produced a slightly larger revenue than during the year 1881. On the Journal account, after paying all the expenses involved in the production of the Journal, a balance remains in favour of the Society of £417 5*s.* 5*d.*

The propriety of changing the investments of the Society's capital has from time to time engaged the attention of the Council, and at the meeting in March last it was resolved that a sum not exceeding three-fourths of the invested capital should be re-invested, as occasion may offer, in freehold ground rents or freehold land. Having regard to the exceptionally high price of Government stock at the present time and the desirability of choosing a form of investment in which a fair average interest is obtainable and an increased value of the capital can in course of time be secured, the Council believes that this change will conduce to the permanent welfare of the Society.

The number of candidates for examination during the year 1882 was in excess of that of the previous year by seventy-three. The number of "Minor" candidates was precisely the same, while for the "Major" the numbers show a decrease of four, for the "Modified" a decrease of five, and for the "Preliminary" an increase of eighty-two.

With the object of rendering the Preliminary examination as satisfactory as possible to all classes of candidates, the Council, acting on recommendations received from the Boards of Examiners, passed a resolution at its meeting in December embracing the following new regulations:—

"That in future the time allowed for the Preliminary examination be four and a half hours, in two periods of three hours and one hour and a half, with an interval of one hour between the two portions of the examinations.

"That the three hours be devoted to Arithmetic and Latin, and the one hour and a half to English.

"That in Latin the present regulation requiring translation into English of a paragraph from the first book of Cæsar (De Bello Gallico) be extended by the addition of Virgil—first book of the Æneid.

"That in each examination paper a passage from both of the authors be given, but that a candidate shall be required to translate one only of such passages.

"That this regulation shall come into force in January, 1884."

The *Library* continues to receive the attention which its importance demands. No less than five hundred books and pamphlets have been added during the year 1882 and it is gratifying to be able to report that there have been upwards of a thousand more readers than in the preceding year.

The *Museum* has been enriched during the year by several important additions. From the Botanical Gardens, at Ceylon, a fine collection of medicinal plants has been received. A number of interesting drugs from Madagascar have also been received through Dr. Parker. From the Colonial Office a valuable collection of the cinchona barks grown in Jamaica has been received, with notes and a catalogue compiled by Mr. Morris, the director of the plantations in that island. From Madras the finest and most complete collection hitherto made of Indian grown barks and species of cinchona cultivated in the Nilgiris has been sent by order of the Secretary of State for India. The collection is accompanied by a catalogue, with notes compiled by Surgeon-Major Bidie, by whom the collection was made.

The *Evening Meetings* during the session have attracted a larger number of members than usual and the numerous and important papers read have excited general interest. It is gratifying to observe that the younger members take a large part in the various discussions and materially assist in sustaining the character and tone of these meetings.

Infringements of the Pharmacy Act, 1868, were, reported during 1882, to the number of one hundred and fifty-five. In the large majority of cases in which it was found necessary to institute legal proceedings, the penalties were paid before the hearing, a few only having been carried into court. The amount recovered is duly entered in the financial statement.

It will be remembered that in the Report of the Council presented at the last Annual Meeting, it was stated that the Council had, for reasons mentioned in that Report, recommended by resolution that certain articles should be added to Part II. of Schedule A. of the Pharmacy Act, 1868. The Privy Council, on whom rests the responsibility of confirming such resolutions, informed the Council by letter, at the end of July, that "pending the consideration of the expediency of further legislation with reference to the sale of poisons it was not desirable to add to the restrictions on the sale of the acids and other articles referred to in the resolution." The Privy Council, however, approved the resolution so far as it affects nux vomica and its preparations, which have accordingly become poisons within the meaning of the Act and are included in the second part of the schedule thereto.

It was also mentioned in the last Report that it had been arranged at an interview between a deputation of the Council and the Home Secretary to send a written statement of suggestions for the amendment of the law for the further consideration of the Secretary of State. A statement of the views of the Council on the subject was accordingly sent to the Home Office, and about the same time reports from the College of Physicians, College

of Surgeons, Institute of Chemistry and Society of Apothecaries were addressed by his request to the Secretary of State. These various reports were subsequently passed over to the Privy Council Office and on due consideration that department after consulting with your President decided that it is desirable that there should be further legislation. With that object a letter was sent in November last requesting the Council to submit its views in regard to the sale of poisons for the consideration of the Lords of the Council in the form of a draft Bill amending the existing law.

As a consequence the Council has prepared and submitted a draft Bill embodying its views, and this Bill is now engaging the attention of the Government. The general approval which the Bill has received at the hands of the members and the trade at large encourages the Council to hope that the Government may see fit to introduce it into Parliament with such amendments as further consideration may render necessary.

It ought not, however, to be forgotten that in order that any Pharmacy Acts Amendment Bill shall become *law*, it is essential that the members of the Society and the trade at large be thoroughly united in the support of the measure both *in* and *out* of Parliament.

The introduction into Parliament of a Medical Acts Amendment Bill has naturally excited some interest amongst those who practise pharmacy. This Bill does not propose to interfere in any way with the legitimate exercise of the business of chemists and druggists; but one of the duties imposed upon the Medical Council is the production and publication from time to time of the British Pharmacopœia. Your Council has resolved that it is desirable that pharmacists should be represented on the Pharmacopœia Committee, and is taking steps with a view to have the clauses referring to this subject amended in committee when the Bill is under consideration in the House of Commons.

The relation of pharmaceutical education to examination formed an important paragraph in the last Report. As, however, the conclusions arrived at up to the issue of that Report were scarcely so matured as to render it practicable for any scheme based upon them to be satisfactorily carried out, the Council in July appointed a Special Committee to consider the best method of giving effect to the resolutions on the subject previously adopted. This Committee presented its report, which was received and adopted by the Council, in March last. That report included, among other suggestions, the following important recommendations, which the Council believes to be eminently calculated to advance pharmacy as well as to conduce to the best interests of the public:—

"1st. Every candidate for qualification to practise pharmacy must pass the Preliminary examination of the Pharmaceutical Society, or one of the examinations the certificates of which are accepted in lieu thereof, and be registered as a Pharmaceutical Student.

"2nd. The pharmaceutical student must then enter the pharmacy of a pharmaceutical chemist, or a registered chemist and druggist who keeps an open shop, as an apprentice or pupil, or in some other capacity as a learner; and be so employed for three years.

Note.—During these three years he may or may not, at discretion, attend one or more of the courses of lectures that form part of the "curriculum" approved by the Council in April, 1882 (*Pharm. Journ.*, April 15, 1882, p. 846).

"3rd. After the expiration of the three years' shop experience, the pharmaceutical student is eligible to offer himself for the *first portion* of the qualifying examination on production of evidence of registration as a pharmaceutical student and of having been employed for three years subsequent to such registration in the shop of a pharmaceutical chemist or a registered chemist and druggist.

"This *first portion* of the qualifying examination to be a written one and to include the following subjects:—Prescriptions, Pharmacy and Theoretical Chemistry.

"This *first portion* of the qualifying examination to be conducted in London, Edinburgh, and such a number of centres in the provinces as will allow the superintendence of each examination by a member of the Board of Examiners.

"4th. An interval of not less than *one year* must elapse between the date of passing the *first portion* of the qualifying examination and the date of entering for the *second portion* of that examination. During that interval the above-named "curriculum" *must be completed.*

"5th. On entering for the *second and final portion* of the qualifying examination, the pharmaceutical student must produce evidence of being twenty-one years of age and of having fulfilled the conditions mentioned in the previous paragraph.

"This *second and final portion* of the qualifying examination to be practical and "*viva voce*," and to include the following subjects:—Practical Dispensing, Botany, Materia Medica and Chemistry.

"This *second and final portion* of the qualifying examination to be conducted in London and Edinburgh only.

The Benevolent Fund has been augmented by three legacies of £100 each, under the wills of the late Robert Howden, of London, Arthur Lloyd, of London, and Charles James Pearson, of Swansea, and shows in addition an increase in donations and subscriptions of over £700. This very satisfactory result in regard to subscriptions is mainly due to the zeal and perseverance with which the claims of the Fund have been urged by the local secretaries. Their services in this and other matters affecting the interests of the Society are highly appreciated by the Council and deserve recognition from the members at large.

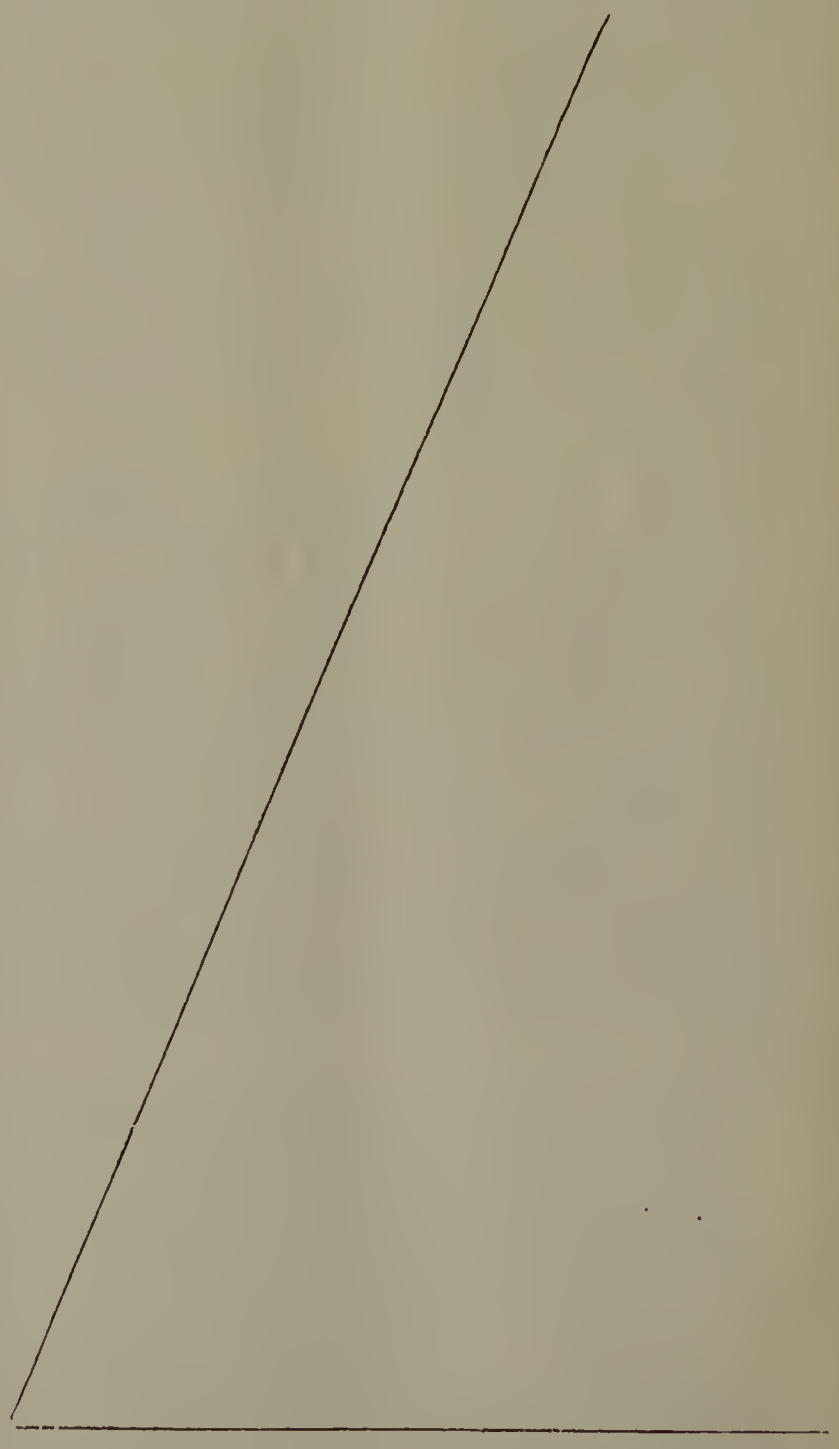
The annual publication of a local list of subscriptions and donations was commenced in February last in the *Pharmaceutical Journal*. This will, it is hoped, materially assist the local secretaries and others in advocating the claims of the Fund amongst those who have not hitherto had their attention called to the pressing claims for relief which the Council receives every month from persons in all parts of the country.

With the view of associating with the Society distinguished pharmacists and others residing per-

FINANCIAL STATEMENT FOR THE

Receipts.

	£ s. d.	£ s. d.
Balance January 1st, 1882:—In Treasurer's hands	2679 3 9	
In Secretary's hands	16 13 2	
In Honorary Treasurer's hands (Scotland)	30 1 8	
		2725 18 7
Life Members' Fund:—Interest		87 16 11
Interest on Investments		614 0 2
Subscriptions:—1645 Members, Pharmaceutical Chemists	1727 5 0	
777 ,, Chemists and Druggists	815 17 0	
1103 Associates in Business	1163 8 0	
824 Associates not in Business	432 12 0	
1037 Apprentices or Students	544 8 6	
15 Entrance Fees	31 10 0	
	4715 0 6	
Fines upon restoration to the Society	37 5 9	
		4752 6 3
Examination Fees:—1359 Preliminary Examination Fees	2430 6 0	
8 Modified ,,	8 8 0	
692 Minor ,,	1895 13 0	
109 Major ,,	426 9 0	
		4760 16 0
Journal:—Advertisements	4588 2 3	
Sales	491 7 4	
		5079 9 7
Registration Fees:—15 Fees for Restoration to the Register	15 15 0	
7 Registration Fees as Chemists and Druggists	36 15 0	
		52 10 0
Register:—Sales to the Government	146 15 0	
Sundry Sales	13 15 0	
		160 10 0
Calendar:—Sundry Sales		17 11 0
Penalties and Costs for infringements of the Pharmacy Acts		36 8 8



£18,337 7 2

YEAR ENDING DECEMBER 31st, 1882.

Expenditure.

	£ s. d.	£ s. d.
Annuity—Dr. Redwood		100 0 0
Carriage of Books to or from the Library, and other parcels		24 17 0
Certificates of Death		17 12 0
Conversazione		
Pharmaceutical Meetings	204 1 7	
	52 4 0	
Examiners, Boards of—		256 5 7
	England and Wales. / *Scotland.*	
Fees to Examiners	1307 5 0 / 189 0 0	
Fees to Superintendents—Preliminary Examination	148 1 0 / 21 0 0	
Hire of rooms for conducting Preliminary Examination	42 0 0 / 4 5 8	
Travelling Expenses	231 6 10 / 6 5 0	
Refreshments for Examiners	86 13 8 / 5 14 4	
Apparatus, Drugs, Chemicals, for Examinations and sundry charges in connection therewith	85 2 4 / 7 2 8	
	1900 8 10 / 233 7 8	
(*England and Wales*)	1900 8 10	
	2133 16 6	
Fees to the College of Preceptors	133 7 0	
		2267 3 6
Fixtures and Fittings		11 19 1
Furniture		37 2 3
House Expenses:—Gas, Water, Coal, Cleaning Materials, &c.		251 0 8
International Pharmaceutical Congress:—Production and Editing of Reports	26 5 0	
Binding the Volumes of the Report	12 10 0	
		38 15 0
Journal:—Editor and Sub-Editor's Salaries	575 0 0	
Paper	1108 2 7	
Printing	1974 18 9	
Publishers' Commission	571 0 3	
Contributions and Engraving	312 9 9	
Reporting	77 9 0	
Attending Conference Meeting at Southampton	10 0 0	
Parliamentary Reports and Sundry Charges	33 3 10	
		4662 4 2
Laboratory:—Professor of Practical Chemistry—Endowment of Chair	100 0 0	
Prize Medals and Certificates	5 2 6	
		105 2 6
Law Costs		169 3 5
Lectures:—Professor of Chemistry and Pharmacy—Endowment of Chair	100 0 0	
Professor of Botany and Materia Medica—Endowment of Chair	100 0 0	
Subscription to Royal Botanic Gardens	21 0 0	
Prize Medals, Certificates, etc.	12 10 0	
		233 10 0
Library:—Librarian's Salary	216 13 4	
Purchase of Books, etc.	157 2 8	
Attending Library Association Meeting	10 10 0	
		384 6 0
Museum:—Curator's Salary	250 0 0	
Assistant's Salary	78 0 0	
Specimens, Bottles and Sundries	39 15 7	
		367 15 7
Branch of the Society in Scotland:—Secretary—Salary	150 0 0	
Rent, Taxes and Insurance	98 2 9	
Miscellaneous Expenses	39 13 7	
		287 16 4
Postage:—General	240 7 3	
Journal (Cost of transmission to Members, Associates and Apprentices)	674 5 6	
		914 12 9
Register, Printing and Publication of		167 4 9
Repairs and Alterations (including painting inside of Building)		805 17 7
Rent, Taxes, and Insurance of Plate Glass	407 1 8	
Insurance on the Premises and Contents—7 years' Premium	283 10 0	
		690 11 8
Returned Subscriptions to Associates		11 18 0
Stationery, Engraving, Printing, and Office Expenses	250 1 8	
Publication of the Society's Calendar	111 2 0	
		361 3 8
Salaries:—Secretary and Registrar	550 0 0	
Assistant Secretary	300 0 0	
Clerks and Servants	811 17 0	
		1661 17
Cost of Materials supplied to the Bell Scholars		10 0 0
Herbarium and Council Medals		8 12 6
Sundries		0 11 6
Travelling Expenses—Country Members of Council		411 12 0
Refreshments for Council		45 11 0
Balance, December 31st, 1882:—London and Westminster Bank on Deposit	2000 0 0	
In Treasurer's hands	1862 11 8	
In Secretary's hands	75 12 8	
In Honorary Treasurer's hands (Scotland)	84 17 4	
		4023 1 8
		£18,337 7 2

BENEVOLENT FUND, 1882.

Dr.

	£	s.	d.	£	s.	d.
21 Annuitants, each received £35	735	0	0			
1 Annuitant received:—2 quarters at £30 .	15	0	0			
2 quarters at £35 .	17	10	0			
14 Annuitants, each received £30	420	0	0			
				1187	10	0

CASUAL GRANTS.

A former Member,	London	age 63	15	0	0
Ditto	London	,, 63	10	0	0
Ditto	Brighton . . .	,, 65	10	0	0
Ditto	London	,, 71	15	0	0
Ditto	London	,, 62	10	0	0
Ditto	Ryde	,, 65	20	0	0
Ditto	London	,, 69	10	0	0
Ditto	Leamington . .	,, 68	15	0	0
Widow of a former Member,	Holywell	,, 52	10	0	0
Ditto	Oxford .	,, 63	10	0	0
Ditto	Devizes .	,, 61	10	0	0
Ditto	Norwood	,, 64	15	0	0
Ditto	London .	,, 67	10	0	0
Ditto	Torquay	,, 61	10	0	0
Ditto	Parkgate	,, 59	10	0	0
Ditto	Sidmouth	,, 65	15	0	0
Ditto	Whittlesea	,, 46	5	0	0
Ditto	London .	,, 42	5	0	0
Widow of a Member,	London . . .	,, 57	20	0	0
Widow of a Life Member,	Dulwich .	,, 50	10	0	0
Orphans of a late Member,	London .	,,12&7	25	0	0
A former Associate in Business,	Penygroes	,, 38	10	0	0
Widow of a former Associate,	London	,, 52	10	0	0
A Pharmaceutical Chemist,	Liverpool	,, 41	5	0	0
A Registered Chemist and Druggist,	Liverpool . . .	,, 67	10	0	0
Ditto	Bridgwater . .	,, 60	5	0	0
Ditto	Warrington . .	,, 70	10	0	0
Ditto	Glasgow	,, 56	10	0	0
Ditto	Edinburgh . . .	,, 68	10	0	0
Ditto	Sheffield . . .	,, 50	5	0	0
Ditto	London	,, 72	10	0	0
Widow of Reg C. & D.,	Devizes . .	,, 36	10	0	0
Ditto	Birmingham .	,, 40	6	0	0
Ditto	Manchester .	,, 42	10	0	0
Ditto	London . . .	,, 60	10	0	0
Ditto	Ashbourne .	,, 72	10	0	0
Ditto	Brigg . . .	,, 45	10	0	0
Ditto	Teignmouth .	,, 34	10	0	0
Ditto	London . .	,, 60	5	0	0
Ditto	Liverpool . .	,, 65	10	0	0
Ditto	Clay Cross .	,, 36	5	0	0
Ditto	London . . .	,, 68	5	0	0
Widow of an Annuitant,	Wells . .	,, 46	5	0	0

				441	0 0
Secretary's Casual Fund				20	0 0
First payment from the Robbins Fund . .				5	0 0
Printing and Stationery, etc.	54	12	2		
Postage	40	18	9		
				95	10 11
Purchase of £100 Consols				100	2 6
Purchase of £60 South Metropolitan Gas Stock (Robbins' Gift)				106	16 0
Commission on purchase				1	6 0
London and Westminster Bank—On Deposit				500	0 0
Balance in Treasurer's hands, Dec. 31st, 1882.				599	13 7
Balance in Secretary's hands, Dec. 31st, 1882.				1	0 9
				£3057	**19 9**

Cr.

	£	s.	d.	£	s.	d.
Balance In Treasurer's hands, Jan. 1st, 1882				235	4	6
Ditto In Secretary's hands, Ditto				2	17	8
Dividends on Invested Capital				563	5	2
Donations	388	1	0			
Subscriptions	1568	11	5			
				1956	12	5
Legacies:—						
Howden, Robert, London	100	0	0			
Lloyd, Arthur, London	100	0	0			
Pearson, Charles James, Swansea . .	100	0	0			
				300	0	0
				£3057	**19**	**9**

We, the undersigned Auditors, have examined the accounts of the Pharmaceutical Society, as presented in the Financial Statement and Benevolent Fund Account, and find them correct. We also find that there was standing to the account of the Society at the Bank of England, and in the hands of the Society's Bankers, on the 31st December, 1882, the following Stocks, viz.:—

		£	s.	d.	£	s.	d.
General Fund	New 3 per Cents.	20,500	0	0			
Life Members' Fund		3,000	0	0			
					23,500	0	0
Pereira Memorial Fund . . .	Consols	100	0	0			
Bell Memorial Fund		2,050	0	0			
Hanbury Memorial Fund . .		400	0	0			
Benevolent Fund		18,600	0	0			
					21,150	0	0
do. (Robbins Fund)	South Metropolitan Gas Stock . .				60	0	0
Secretary's Casual Relief Fund. . . .	Consols				105	0	0
Hills Prize Fund	Russian Bonds				300	0	0

W. HODGKINSON
F. HARWOOD LESCHER
S. LLOYD STACEY
HENRY AYSCOUGH THOMPSON
W. MANNING WATTS
Auditors.

February 28th, 1883.

manently outside the United Kingdom, the Council has decided to recommend the members at an early convenient opportunity to pass a new bye-law to enable it to elect such persons as *corresponding members*. It is desirable that the interest which so many of these eminent men take in pharmacy should be enhanced by official recognition on the part of the Society, in the same manner as the labours and and services of British pharmacists are recognized by Continental and American Associations.

In concluding this Report the Council has to regret the loss, among other valued members of the Society, of Alfred Allchin, S. U. Jones, of Leamington, Robert Howden and Matthew Pound. Mr. Allchin was for many years associated with the Executive of the Society, first as a demonstrator in the Society's laboratory and afterwards as an examiner, and had endeared himself to all those with whom he came in contact. Mr. S. U. Jones, Mr. Howden and Mr. Pound were each well known to, and regretted by, a wide circle of friends. They did not fail to avail themselves of every opportunity for advancing the interests of the Society and earning the goodwill of their brother pharmacists.

The PRESIDENT, in moving the adoption of the Report, said the first paragraph dealt with the finances, and, as usual, they expected to be criticized on that point, but probably not so severely as if they were in a position of having to declare a dividend. He did not propose to say much about the annual receipts and expenses, but would pass to the second paragraph, which referred to the propriety of changing the investments of the Society. It was well known to many of the older members that from time to time this question had been discussed, and during his tenure of office the Council had decided at length that it was desirable to change a portion both of the Benevolent Fund and General Fund investments and to invest the money in freehold ground rents or land. The object contemplated was, on the one hand, to get a higher rate of interest, with ample security, and on the other, to provide for increased stability in the future. When the Society's capital was very small, it was natural and convenient to invest in Government stock, but having regard to the present high price of stock and the possibility that there might be a conversion, as was now being carried out in France, it was desirable that corporate bodies like themselves, having large funds to deal with, should consider what was best for the future welfare of the body. It seemed to the Council wise to invest in such a way that they might sooner or later, perhaps in fifty or sixty years, be able to carry on the business of the Society without calling for subscriptions at all. If they could do that without imposing any additional burden on the pharmacists of the present generation they would all agree that the Council was wise in thus dealing with the Society's capital. It was well known that it was difficult to get more than 3 per cent. for investments in Government funds, but on freehold ground rents it was possible, as a rule, to get 4 per cent. Their information, gathered from all sources and based on actual observation during the last two months, showed that a freehold ground rent was worth actually 4 per cent. when the reversion was tolerably distant. One of the reasons why these investments were fairly good for corporate bodies was that they did not die. Individuals died, and ground rents were slightly inconvenient for trustees of deceased persons to deal with; therefore it was that persons in that position generally invested in Government securities; but corporate bodies, like themselves, might very fairly invest in ground rents without the possibility of having to sell out and divide at any particular time. With regard to the number of candidates who presented themselves for examination, the clause spoke for itself. It seemed pretty clear that the number presenting themselves was still very large, though he deeply deplored that so many were turned back. They must all regret the waste of time on the part of so many candidates which this disclosed. Of course, it was the duty of the examiners, representing the Government of the country, to reject men who were not competent to perform the duties to be placed in their hands; but, at the same time they could not but think how much better it would be if by better training beforehand, the Board of Examiners were able to certify that a much larger percentage of each batch of candidates was fit to be entrusted with this important duty. The Preliminary examination had received some consideration with a view to giving a wider range and greater latitude in the Latin subjects. He need not refer further to that point, but it was, of course, very important that the Preliminary examination of men

who were to be future pharmacists should be fairly good, and although the process was an improving one, so far as his experience went, it was not improving so rapidly as they could wish. It was a fact that many of the candidates had been placed in a difficulty when having to deal with three subjects in so short a time as three hours, and it was therefore proposed that after next year the candidate should be examined for an hour and a half in Latin, then in arithmetic for another hour and a half, and after luncheon another hour and a half would be devoted to English. In that way it was thought that many boys, who did the first portion pretty well but said they had not time for the English, would be assisted in giving the examiners a better idea of their capacity. The Library and Museum continued to make satisfactory progress, as was stated in the Report. They were indebted to a number of members, to gentlemen outside the Society, and various Government departments for gifts not only to the Library but to the Museum. He might also remind members that they had the nucleus of a very excellent library in Edinburgh and he was sure there were many members who had old works on pharmacy and medicine, who would perhaps like to present them to the Society, but hesitated to do so because they knew that in London they had a complete collection of such works. In the Society's library in Edinburgh, they were not very strong in ancient works on pharmacy or science. A considerable number of infringements of the Pharmacy Act had been reported during the year, and in many cases the offender had paid the fine and had not gone into court at all. Sometimes he went on doing wrong after he had paid one fine and had to pay a second fine, so that there was some difficulty even by the enforcement of fines in preventing individuals from breaking the law. Nevertheless, if the members of the Society knew how many hours the Council spent in considering these matters they would be more considerate than they sometimes were in the remarks which they made on this topic. It was not possible to publish all they knew in various cases of infringement, nor was it possible for the Secretary to write to every local secretary who gave information, stating the reasons which actuated the Council in either moving or not moving in reported cases; but they might all be assured when he told them that the members of the Council every month devoted the best part of Tuesday evening to considering cases which were sent up to them, and that every case was thoroughly sifted on its merits. On the question of poisons the next paragraph referred to the report presented at the last meeting. It was then proposed that certain strong acids should be placed in part 2 of the schedule, but the Privy Council did not see its way to adopt that resolution; in writing on the subject they said "pending the expediency of further legislation they did not see their way to confirm the resolution. As was mentioned in the Report, the Government had said that some sort of legislation was necessary, and the Council of the Society, acting at the request of the Privy Council, had prepared a Bill which had been before the members for some time. He should suggest that any discussion on that Bill should be deferred until Mr. Sandford proposed his resolution. But he was anxious to impress on the members the fact that this Bill was put into the hands of the Privy Council to be brought forward as a Government measure; it was not a Bill which the Society proposed to bring into Parliament as a private measure, and, therefore, some of the provisions were drafted in such a manner as to meet the views of important Government officials, who had considered various matters connected with the working of the present law, and who thought some deviation from the law as it had hitherto been was desirable. In saying this he did not wish to divest either himself or the Council of any responsibility in the matter, but it was important that this should be borne in mind. What might be done hereafter it was not for him to say. The Government might decline to introduce the Bill into Parliament, or they might suggest amendments; but when that time came, when they got a definite statement of the views of the Government, they would take care to deal with the Bill so as to adopt, as far as they could, the amendments which were practicable and for the general good. The introduction of the Medical Act Amendment Bill was also referred to in the Report, and the Council had thought it desirable, besides the letter which he was instructed to write some weeks ago to the Lord President of the Council, to send a memorial to Mr. Mundella, setting forth the views of the Society's Council, and which he believed would be the views of most pharmacists, as to what they thought would be a proper way of dealing with Pharmacopœia revision. In connection with this subject it was not necessary or desirable to criticize the action of individuals. The question was really a public one: how far pharmacists should be appointed on a Committee for revising the Pharmacopœia. The question of what experts should be appointed, whether as editors or assistants, was outside the question. The sole question for them was, were they not reasonable in asking that there should be competent pharmacists on the Committee to see that the experts and others did not make suggestions which were impracticable and unworkable. He felt sure that the more the subject was brought before the medical profession, the more certainly would they adopt, by a large majority, the view that there should be educated representative pharmacists on that Committee. Pharmaceutical education occupied a long paragraph, in which was inserted an abstract from the report of the Committee, who had spent a long time in considering the subject. On this Mr. Vizer had given notice of a slight amendment. He did not propose to say anything upon it until he heard Mr. Vizer's views; but he semed to agree with the Committee, as far as he understood, up to a certain point, but would allow the candidate to come up for the first portion of a technical examination two years after he had been in the shop. Perhaps Mr. Vizer would be able to convince the members that that was an advantage, but up to the present time he and his colleagues had thought three years were essential and a great advantage to the candidate himself. The Benevolent Fund had made satisfactory progress during the year, the members at large, the local secretaries and the officers of the Society spread over Great Britain had worked very well for it, and there was a hope that they might be able to stir up not only those connected with the Society, but a large number of others who were on the Register, and who did not see the importance of this Fund to all chemists and druggists. He might say the great majority of applications for relief were from registered chemists and druggists who had never been connected with the Society at all. The Society was truly catholic in its distribution of this Fund; it looked on the whole trade as being part of one body corporate when applying for assistance, and, therefore, it had some claim to ask those who were outside to give more support to the Fund. The last paragraph but one referred to the election of corresponding members, and that might require a little explanation. The Bye-laws at the present time only contemplated the election of a certain class of non-paying members, called honorary members, but the Council was anxious to have power to appoint distinguished men who assisted in various ways, to the position of corresponding members. Many comparatively young members of the Society who had made a position for themselves in the world of pharmacy or science were recognized in this way by Continental and American associations, and it seemed desirable that the Council should be able to do the same thing in return. In the last paragraph, the Council had to regret the loss of some of the members who had died during the year. Of course there were many others who had passed away, and who had done good work in their time, but who had not held office, and as to whose position and labours

they were not officially informed. They were quite aware that there were a number of men in quiet nooks and corners of the country who were doing very good work in pharmacy, but whose names never appeared in public. Their work was none the less appreciated; but it was essential in this official Report to confine it, in order not to be misunderstood, to the mention of those who had held office and taken part in the various public works connected with pharmacy. He would conclude by moving—

"That the Annual Report of the Council now read be received and adopted, and printed in the Society's Journal and Transactions."

The VICE-PRESIDENT seconded the resolution, and said he would reserve the right of making any remarks till later, if necessary.

Mr. VIZER (Brighton) then moved the following amendment, of which he had given notice:—

"That the Report be adopted, etc., with the exception of the third and fourth recommendations of the Special Committee in relation to pharmaceutical education and examination, in respect to which the following alterations are considered desirable:—That in Recommendation No. 3, the term of *two* years should be substituted for *three* years; in Recommendation No. 4, "six months" should be substituted for "one year"; and that the syllabus of the proposed Curriculum should be so altered as to enable a student to pursue the necessary studies during the three years' apprenticeship if so desired."

His object in moving this resolution was strictly with a view of endeavouring to assist the Council in bringing about such a curriculum as would be a boon. Many present knew that his views had always been in favour of raising the standard of education, and they all owed to the President and Council a debt of gratitude for the extreme care which had been taken in bringing forward this scheme, but there were certain points in it which he he could not help feeling needed a little adjustment. With regard to the first recommendation, that every candidate should pass a preliminary examination, that seemed to him a *sine quâ non*. The second recommendation was that three years' apprenticeship should be served, and that also he fully endorsed. But when they came to three, where a hard and fast line was drawn without any allowance being made for differences of young men's educational powers, opportunities, and privileges, it seemed to him likely to prevent young men utilizing their time to the greatest advantage. It stated that at the expiration of three years a student is eligible to offer himself for the first portion of the examination, and then the fourth clause was that an interval of not less than one year must elapse between the date of passing the first portion of the qualifying examination and the date of entering on the second portion. Now it seemed to him exceedingly hard that a young man entering a business should be compelled to pass three years before he had any possibility of passing the examination, and that after he had spent three years another twelve months should have to be spent in preparing and going through a certain course of lectures and practical chemistry which possibly he might have had an opportunity of pursuing during his apprenticeship. If a young man had extra abilities or advantages, and if his master did his duty by him, by the expiration of two years he ought to be thoroughly prepared to pass the first portion of such an examination, and at the end of the next year, by a little extra application, he believed there would be no difficulty in many instances in his coming up at the end of his apprenticeship and passing the full examination. To say that a young man must, notwithstanding, still remain a student for another year would be exceedingly hard both on the student and on his master, and anything which could be done to remove that difficulty seemed desirable. His amendment was drawn with a view to meet that. It was said that this was done in order to forward the interests of the public, but he would venture to ask, how far was this borne out by daily experience? Was it absolutely necessary for the interests of the public that this extra time should be spent beyond a legitimate apprenticeship? Both of the Government visitors stated most distinctly that it was not necessary. (Mr. Vizer here read extracts from the reports of the Government visitors as confirming of his views.) It was not found either that the medical profession required anything further than was at present imposed. As a rule medical men in their respective towns did not support and recommend those chemists and druggists who possessed the pharmaceutical diploma. Again, did the public demand it? The answer was when they looked round they saw that the public did not appreciate examined men in comparison with the amateur shopkeepers who employed registered men as their assistants. All this proved to demonstration that it was not desirable to lay a heavier burden on students than was absolutely necessary; but on the other hand, they should endeavour if possible to enable them to pass the examinations as easily as was practicable. These regulations were introduced with the idea of doing away with cramming, and no one could abhor that more than he did, but it seemed to him that this would rather encourage it. Both master and student would naturally argue if the apprentice was necessarily to go through twelve months' curriculum at the school, was it worth while to forego his services during his apprenticeship? The master would make the most he could of him, and at the end of the time the student would come up and endeavour to cram up the technical knowledge required; on the other hand, as he proposed, both master and apprentice would be interested in making the utmost they could of their time, in order that the student, if possible, might pass his examination before the expiration of his apprenticeship. He, therefore, asked the meeting to take the subject carefully into consideration.

Mr. WHEELER seconded the amendment.

Mr. WHITTLE thought it was a wise decision of the Council to invest in freehold ground rents, but he hoped they would not invest in land, which was rather speculative. They might also turn their attention to railway debentures and preference stocks, which often paid 4 per cent. and sometimes more. The President had suggested that they should say but little about the Pharmacopœia, but he was quite certain that every assistant and every chemist had for years felt it of the greatest importance that they should be represented on the Pharmacopœia Committee, and they felt very strongly the action of the Professors in not communicating with the Council on this matter. They knew the Medical Council could not do this work by themselves, and felt it very strange that the Professors should have acted in the way they had. Mr. Vizer had not convinced him at all; he thought three years was quite short enough, and it was only by an increase of education that they could advance their status at all. They could only go to Parliament on the plea of having a superior qualification, and two years was not long enough, and even if a few were capable of passing at that time the extra year would do them no harm.

Mr. ALLEN said, this question which Mr. Vizer had brought forward was one he felt great interest in, especially as it was not so very long since he had himself been a student. The recent regulations had altered to a certain extent the character of the trade. The three years' qualification which was now insisted upon was not required immediately after the passing of the Pharmacy Act, in 1868; but since its introduction, three years' apprenticeships were the order of the day, and a large number of young men came to London from the country, who had served that time. It was a question for those present, how far the three years' apprenticeship had qualified these young men to serve as junior assistants. As a rule, these young men came to London and took the proper course of obtaining situations as improvers in some London pharmacy, and, after a time, entered the

School of Pharmacy and so went through some form of curriculum, and by-and-by qualified as members of the trade. When he was apprenticed, the ordinary rule was five years, or occasionally four, and he must say he thought the five years' apprenticeship turned out a better class of men than the three years' term did. Young men now came to London after three years' apprenticeship, went straight into the school and in four months qualified to pass the Minor; they were then scarcely content to take the position of a junior, and if this amendment were passed he feared that two years' apprenticeship would be the rule. He was one who, unfortunately never went through any form of curriculum, and he now looked back with regret to think that he was unfortunate enough to qualify for his examination without doing so, and sometimes wished he had time even now to attend the regular courses of lectures. It was really a question whether two years' apprenticeship was sufficient.

Mr. VIZER said he did not advocate a two years' apprenticeship.

The PRESIDENT said Mr. Allen's observation was quite fair; his argument being that, inasmuch as during the past seven years, when the three years' regulations had been in force, the term of apprenticeship had been diminished to three years; so if Mr. Vizer's proposal were adopted there might be a disposition to shorten that period to two years.

Mr. MARTINDALE thought the meeting would fail to see the force of Mr. Vizer's argument. In any case a man could not pass the second portion of the examination until he was twenty-one, and if he was apprenticed at sixteen four years might be passed in a practical pharmacy and there would still be a year left for the curriculum.

Mr. URWICK thought three years was quite short enough; if anything, too short. He did not think that young men who had passed through short periods of apprenticeship, when they came to London, made such good assistants as those who came to London in old times, and certainly two years would be much too short. With regard to twelve months' interval between the two portions of the examination, he agreed with Mr. Vizer.

Mr. RIMMINGTON said three years might be enough for some, but not a bit too much, and four years was not too much for any young man to master the details of a chemist's shop. He might be very clever and pass any examination, he might be a great genius, but he was not a shopman and could not manage a business. His experience was that most sensible parents would not like their sons to be out of their apprenticeship before they were twenty years of age. He had for some years taken apprentices for four years, sometimes four and a half, and would not take them for less. The success of conducting a chemist's shop did not depend altogether on scientific knowledge; in fact, there was a great deal more of practical science required than of exact science.

Mr. BLAND said he should for many reasons have prepared to remain silent, were he not convinced that a crisis had now arrived in which their interests as pharmacists were seriously imperilled, and which might involve disaster and even ruin to the Society. Looking back to the objects of the Society when it was founded, two were mentioned, first, the protection of chemists from the outward attack of their enemies, whose name was legion, and secondly, the establishment of a School of Pharmacy, which should furnish a succession of able and competent men for the discharge of the functions of their office. With regard to the latter object they were entitled to say that the pharmacist of the present day was a far superior man to the average chemist and druggist of forty years ago. It was clear and undeniable that the articles supplied to the public in the shape of drugs and medicinal preparations were far superior to those generally obtainable then. There were few places on the Continent, where scientific pharmacy had been cultivated to the highest extent, where the practical duties were better performed than they were in England. But with regard to the other object contemplated by the originators of the Society, he must say that he thought it had resulted in a miserable failure. They had an Act of Parliament passed for their protection, and to give them a legal status, whatever that might mean. What had been the result? If they looked to the leaders in the profession, the old historical houses which they often heard of, did they not find that a number of those houses had come down from the lofty position which they once occupied, and had taken up the weapons of Professor Holloway and Professor Chlorodyne Browne. Was their status any better? If they looked to the position of the rank and file, they had an actual and legal title which other men could not encroach upon, but as far as his experience went, nine hundred and ninety-nine out of every thousand of the public did not know or care a button about the meaning of the words "pharmaceutical chemist." What was the protection of the Act of Parliament? They were placed under the most severe restriction as to their qualification, and as to the sale of poisons; there was a poison clause which everybody who looked into the matter knew could not be strictly and literally carried out. He could easily conceive that gentlemen living in the West End might find it easy to comply with it, but he would mention a case which would show it was not so easy. Near him there was a large firm employing, perhaps, two hundred men, who constantly required to use cyanide of potassium in their business; they sent for it on a printed order, signed by a clerk, whose name and handwriting he knew perfectly well. The Act said he must have the signature of the person in his register. But the boy or man who came for the article was not the purchaser; the master was the purchaser; and if he were to send the messenger back to say that one of those gentlemen must himself come and sign the poison book, any one could imagine what the consequence would be. The Pharmacy Act put them under all sorts of restrictions, and yet it allowed all manner of interlopers to come and filch away 90 per cent. of their legitimate trade. With regard to the preparation of a new Pharmacopœia, in process of time of course the British Pharmacopœia had become somewhat antiquated, and it was necessary that a new edition should be issued. Although there were a few medical men who had had some experience of the theoretical part of pharmacy, and there might be many pharmacists who were ignorant of what they ought to know, he did not hesitate to say, taking them all round, that they knew more of pharmacy than medical men did. Then why should a body of men who knew more of the matter than anybody else be left out in the cold? Suppose the Government thought a new treatise on the practice of medicine should be published, and certain laws laid down on the diagnosis and treatment of disease, and after stating what they wanted, sent and imposed on the Council of the Pharmaceutical Society the preparation of such a book. Would not medical men soon cry out about that, even if the Pharmaceutical Society were told that they might, if they thought desirable, call in for consultation one or two persons from some of the universities, or even ask one or two eminent physicians for their assistance, but only on condition that they should come round and offer it at the back door? Yet that would be a very apt parallel to what was now taking place. Something had been said about the influence of the Pharmaceutical Society with the Government; but it appeared to him that although the Privy Council had on certain occasions asked the opinions of the Council on certain matters, that had been done more for the purpose of snubbing the Council than from any desire to get real assistance. There were representative scientific men capable of giving advice in the matter, under whose auspices they might hope for a better Pharmacopœia than could be obtained without them; but if that assistance was not to be rendered in a fair and straightforward manner, he should recom-

mend every pharmacist to stand aloof, to let the medical men do it by themselves, and see what sort of a book they could turn out. Then when it came out, they would look at it and tell them what they thought of it. There was another matter on which he held opinions which he feared would not be quite in accordance with the Council, and with those of many members present, and this was on this question of the curriculum. He believed that if this were passed and became law, it would be a heavy blow, and great discouragement to the profession of pharmacy. He took this so-called curriculum, and found a syllabus of lectures to be gone through by the student, which occupied simply in cataloguing the names of the subjects two pages of the Journal. The idea was that a student would generally master those subjects in one, two or three years, but instead of that a lifetime would be scarcely sufficient. He could point out subjects which had occupied the whole lives of eminent men, and yet they confessed that they had very far from exhausted the subject. Yet here were young men whose faculties were scarcely matured, who had just come from their apprenticeship, where their progress must be very rapid if, in three years, they could acquire a good practical knowledge of a chemist's business, and they were supposed to come and swallow down the whole of these subjects in two or three years. He thought the Council might very much have simplified the matter if they had passed a resolution that no candidate should be permitted to present himself for examination until he had swallowed the last edition of the 'Encyclopædia Britannica,' and was further prepared to undergo an examination in Dioscorides. When he had done that, what was the splendid reward open to him? He was permitted to sell a pennyworth of oxalic acid or white precipitate, and he might even sell a pennyworth of nux vomica if he were prepared to do sixpennyworth of writing about it, and spent another quarter of an hour in instructing his customer as to the necessity of putting his signature in the poison book. He was looking over his poison register the other day, and saw an immense amount of writing, which, if it had been done by some pettifogging lawyer's clerk or deputy registrar of births and deaths, would be paid for in pounds; but he was expected to do all that for nothing and to find his own books. And yet he could truly say that that register had never been of any earthly use to any person whatever. All this made him think that they should be very careful about increasing the burdens on young pharmacists. There was another question which had not often been raised, but was of some importance: What became of the better class of students who were turned out of the School of Pharmacy? Was it not a fact, that failing to find a scope for the scientific attainments which they had reached, they turned to something else which was more remunerative? He could point to a number of men trained in that School whose services were now altogether lost to the profession. He thought, therefore, they should be very careful how they increased the difficulties in the way of entering the profession. One further remark he would make on the syllabus of lectures, and that was, the remarkable omission of any mention of the construction and use of the microscope. Now, if one thing more than another was necessary for an accomplished pharmacist of the present day to be acquainted with it was the use of the microscope.

Mr. GILES said he should like to be permitted to reply to one or two of the observations which had been made, more especially because the last speaker had addressed himself to the really important question which awaited the consideration of the meeting. He began by saying that the prominent objects of the Pharmaceutical Society at its institution were the protection of members of the trade; that he most emphatically denied. It was undoubtedly true that an attack on the trading interest of chemists and druggists was the cause of bringing together a defence association, but that defence association most prominently set forward in its programme that its first object was the elevation of pharmacy. It could scarcely overlook the rights and protection of members, which were associated in a second place in the declaration; but that which they most prominently asserted, and that which gave vitality to their organization, and which had preserved it to this day, in strong contrast to all other organizations which had risen from temporary causes, was that they identified themselves with the elevation of pharmacy. That was the essential policy of the Pharmaceutical Society, though it had sometimes been a little lost sight of. Very often mischief had been done to the interests of the Society by losing sight of that fact, and by showing rather a tendency on the part of some persons to degrade it into a trades union of pharmacists, instead of making it an association for the elevation of pharmacy. Another observation made by Mr. Bland was that he did not understand the meaning of legal status. Now that was a matter of immense importance; it was the only thing which enabled them to put forward a claim to be participators in the compilation of the Pharmacopœia. Would it not be supposed that where a country possessed a recognized body of pharmacists, where it had sanctioned the existence of an institution especially charged with carrying on pharmaceutical affairs, that it would also proceed in natural sequence to refer all pharmaceutical affairs to the care of that body and of that institution, and emphatically first and foremost that in the compilation of the Pharmacopœia it would call in the aid of that body through the operation of that institution? It amounted to a truism to say that that should be so, but as a matter of fact it was not so; and why was it not so? There was no rational answer why it should not be so; but if they asked why it was not so, a little time might usefully be spent in considering it. First of all, pharmacy had very seriously retrogaded in this century, in reference to the relation it held to the Pharmacopœia. In the year 1809 the pharmacists, that is to say, the apothecaries, for there were then no pharmacists except the apothecaries, formed part of a joint committee to frame the Pharmacopœia, together with Fellows of the College of Physicians; but the Society of Apothecaries soon renounced the practice of pharmacy, and directed their attention to other matters, and then chemists and druggists rose up to occupy the place that apothecaries had previously held. But they did not immediately fill it in a satisfactory manner; they did not place themselves in such a position. In fact they had no position; they were a disorganized, disassociated mass of matter; they had no organized unit through which they could make their claim known, and, therefore, they had no claim to be consulted on the matter of the Pharmacopœia. In point of fact, a national work of that character could not with any propriety be placed in the hands of private persons, however qualified they might have been, even if there had been, which there was not, any organization through which their qualifications could have been made known. So they came to 1841 and 1843, when the Society was instituted there was still no change. The duty of preparing the Pharmacopœia remained still in the hands of the College of Physicians until the year 1858, when the Medical Bill was passed, which transferred that function from the College of Physicians to the General Council of Medical Registration and Education. At that time the Pharmaceutical Society was six or seven years old, for it had had a very slight measure of recognition from Parliament in 1852, and it wisely, perhaps, abstained from urging claims which it would not have been in a position to justify; so it happened that the Pharmaceutical Society was still left out in the cold with regard to the Pharmacopœia. But that was some twenty-five years ago. How was it that in 1883 they still found themselves in the same position, with distinct unwillingness on the part of medical bodies to accept official equal co-operation from the pharmacists? That was a question the meeting had

to consider. It seemed to him that the Council would be committing an unpardonable breach of duty if they refrained from pressing their claim, whether it were accepted or not, for they should never be parties to being excluded from such a work. The Pharmacopœia was a pharmaceutical laboratory book, and was there any sense in committing it to men who had no knowledge of pharmacy, and excluding from it persons who were bound by law to have that knowledge'? The thing was monstrous and absurd. What did Dr. Redwood say at Southampton about the Pharmacopœia? That it was not the business of the compilers of the Pharmacopœia to invent new remedies, but to select and adopt them. Who invented them? The pharmacist; the pharmacist did everything except receive the credit. Were they content to go on any longer in that position? Was it right that the work should be done for the Medical Council, who acknowledged by their acts that they were incompetent to do the things themselves? Why did this state of things exist? He was sorry to say he must assume an unpleasant duty in reference to this question, for he thought the Pharmaceutical Society had something to blame itself for in this matter. The last forty years had certainly been years of enormous progress of pharmacy; all that existed had been developed from nothing in that time, but it was not forty years of uninterrupted progress. There were times of agitation, cavilling and opposition to the legitimate policy of the Society, by which great mischief had been done, and this had had the effect of lowering the *personnel* of the Society. He must say in the presence of the Council, many of whom he knew, and many of whom he did not, that the calibre of the Council was not what it was or ought to be. In saying that he said nothing which should give offence to any one member of the Council. They, on the other hand, should understand better than anybody else how true it was. He believed the fact to be that the Medical Council were not willing to accept into a Committee the individual members who constituted the representatives of the Society at the present day. He said this with great respect individually for those members whom he knew, but was it not the fact that they had not got now, even if they could be found, such men as he remembered on the Council, men like Jacob Bell, Deane, Morson, Savory, Squire, Hanbury, and men of that calibre, who had a mere dead weight of influence and importance which would help the Society very much in its present condition. How was this to be avoided? Good candidates had, he believed, been deterred from some lamentable electioneering tactics which took place some time ago when good men were rejected and men of less note were chosen. They did not come forward, and, therefore, it was not possible for the members of the Society to elect them. But it was possible for the Council to find good men if there were good men, and to create vacancies and bring them in, and he thought they might fairly ask that from the patriotism of the Council. There were no doubt some who had been there so long that they were desirous of retiring if they could find eligible successors, and it was also important that they should have more London members having London influence. However good a gentleman might be, and however much respected in his own locality, gentlemen from the country were not known to the bodies with whom the Society had relations in London. It was a serious matter, as he saw by the statement of accounts, that the travelling expenses during the last twelve months had been £403, which was quite a little annuity, and this charge had been increasing in a geometrical progression ever since the beginning of the Society. For the first period ending in 1850 the travelling expenses were £45; for the years ending 1860 they came up to £90; for the years ending 1870 they came up to £156; for the years ending 1880, £360; and for the last two years it was £403. By all means let this expense be incurred if it was any good; but if instead of being any good it prevented their having on the Council men who had an influence which could not be ignored it was very desirable to have another change and retrace their steps to the condition of things which existed formerly. He had heard of one case of a most eligible member having felt himself kept back from the Council, not because he was not willing to devote his time to it, but because since the new arrangements of reporting the Council proceedings had been introduced, so much time was wasted in talk that he really could not afford to sit it out. Speeches were addressed, not to him or to those that sat around the table, not to the business in hand, but to the constituency outside. He had always disapproved of reporting the Council proceedings. He remembered the argument at the time was that all representative bodies were reported, the proceedings and speeches in Parliament were reported, and so should the proceedings of the Council; but they forgot that that meeting was the parliament; the Council was the government, and the government was not in the habit of reporting their speeches. When he was on the Council for two or three years, one gentleman there possessed undoubtedly important influence, both in the Council and out of it, but if everything which that gentleman (Mr. Hanbury) had uttered during the whole of the meetings he attended had been reported in the Journal it would not have filled one page; at the same time nobody ever sat at that Council Board without feeling the influence of Mr. Hanbury, and when he spoke they perfectly well knew what he meant. The conclusion he came to was that the Medical Council were more willing to have to do with the Professors, whose services they could retain for a certain consideration, than to accept into their Committee the said Professors' masters on equal terms. Very small and mean influences often governed the world, and that kind of thing had a great deal of influence in the present state of the relations between themselves and the medical body. He did not know whether it would be quite in order to refer to a communication which took place between that Council and the Medical Council, but he understood a letter was on one occasion addressed to the Medical Council, which courteously and respectfully asked that the Pharmaceutical Society should be allowed to nominate members to co-operate on the Pharmacopœia Committee. He understood that that communication was treated with the greatest disrespect; its receipt was acknowledged and no further notice was taken of it. He trusted that was forgotten and that better times were coming, and that by conciliation and by approaching the medical bodies courteously and temperately their co-operation might be obtained. But they must not rest there. They had a claim which no body could possibly resist for pharmacy to be represented in connection with the Pharmacopœia. That was universally recognized in every nation throughout the civilized world, and if they submitted to a stigma, which might or might not be deserved, they were responsible for bringing on the republic of pharmacy throughout the world a reproach under which it ought not to suffer.

Mr. Frazer said it was his intention to have sat silent, having inflicted on his friends who chose to read it a pamphlet giving his views; but questions had arisen which were not before him when he penned that pamphlet, and, therefore, he must be excused for saying a few words. He must say that his views with regard to the Pharmacopœia were not in harmony with those expressed by Mr. Giles, or, he believed, with the sense of the meeting. His opinion was that they, as pharmacists, had no legal position in the matter; the pharmacists had no right to interfere with the medical man's prescriptions, and he considered the Pharmacopœia was the medical man's prescription book. The medical man found it convenient to give in one line what he might put in six or a dozen; he might give the formula of every pill and every ointment he prescribed, and then they could not assert any right to interfere with them. That was the

principle he went upon, that the medical man was within his right in asserting sole supremacy in saying what the Pharmacopœia should contain. At the same time, he thought, as a matter of policy, it would be wise for the medical men to invite co-operation. Mr. Giles said the apothecaries were antecedents of the Society, and that, originally, apothecaries formed a part of the Pharmacopœia Committee; but, as he understood, the apothecaries of that day were entitled to prescribe, to feel pulses, and to employ the stethoscope, and if that were so, they were not in the position of apothecaries, not being by law allowed to prescribe and take fees for it.

Mr. GILES said he believed at that time apothecaries were not recognized prescribers; but there was a quarrel between the physicians and the apothecaries whether the latter could prescribe, as it was still a quarrel whether chemists might prescribe or not.

Mr. FRAZER said Mr. Giles had also remarked that pharmacists brought in new remedies, but they did not put them in the Pharmacopœia; it was not medical men who brought in the new remedies and adopted them. He could not sympathize with Mr. Giles as to the standing of the Council. Going to another point which had been mentioned he thought it was a great mistake to change the investments; in Scotland those investments which of late years had proved most disastrous were in connection with real property, and, therefore, he hoped the Council would be very careful in this matter.

Mr. LONG said the question was, How was the Pharmaceutical Society to be constituted? They must have members, and if there were no inducement for members to join, how was it likely they were going to maintain their status? Mr. Giles said they were deteriorating and that the Council was not what it ought to be; but that was the fault of the members, not the fault of the Council. Mr. Frazer thought that if a man had bought a suit of clothes he ought not to be allowed to wear them. He did not believe in monopoly, but he believed in a man's right, and he was very much disgusted to see after all the time they had been trying to benefit the public that anybody could do what they did except call himself a chemist and sell poisons. One of the questions before them that day was the Pharmacy Acts Amendment Bill. It was not the Pharmaceutical Society's Bill. They could not pass an Act or they would pass it exactly according to their own liking; but they had to go to Parliament, and they knew how difficult it was to get even the most legitimate thing passed there on account of the large vested interests which were there represented. The great thing to be done was for pharmacists to look well to themselves. They all ought to belong to the Society, and with regard to this Act they must show they wanted something. The first thing was to decide on what they wanted, and the next thing was to trust the Council. With regard to Mr. Vizer's amendment, some people said education was of no use and some said they were not educated enough. There was no doubt the more educated you were the more prepared you were. Entry into the Society had been greatly facilitated, for when he first joined it membership was only obtainable by examination; shortly afterwards, a new principle was established, that any man who had been in business so many years might divide his examination. Then came the Pharmacy Act of 1868, which established the Minor qualification; and now came another change, under which there was to be one examination which would constitute every one who passed it a pharmaceutical chemist. He did not think they could have too much education; failures resulted from want of preparation, and that could not be obtained without going through the legalized studies. At the same time he thought it would be a good thing if they had an assistants' examination.

Mr. HAMPSON said he did not feel himself of very much importance on the Council, and was quite willing to give place to Mr. Giles or anybody else who could better fill his place; but he must say that that gentleman had given one piece of bad advice, namely, that the Council should take upon itself the duty of interposing in an irregular manner with the constitution of the Council. He believed the safest method was the straightforward one; that men ought to sit on the Council who were sent by the suffrages of the members, and that any deviation of the kind suggested, if followed, would simply lead to very baneful results. There would be no confidence left in the Council; little as there appeared to be in Mr. Giles's mind at present, there would be a great deal less, if it became a hole and corner business transacted in some chosen spot in London. He heartily supported his views with respect to their position with reference to the national Pharmacopœia, and he believed the reason they had not attained that position was that they had not had the opportunity. Medical Bills did not come in every year; there were occasional opportunities and he hoped they had seized this opportunity to properly represent the position of the Society. But after all it did not depend so much on this much mistrusted Council, but on the members at large. The Council, good, bad, or indifferent, had only a certain power; but if every member of the Society exercised his legitimate influence with his member of Parliament the thing would be perfectly easy, because their case was absolutely perfect. They had a claim which could be resisted very little longer.

Mr. MACKENZIE said he was very far from endorsing a good deal of what Mr. Giles had said. The Society included Scotland, but Mr. Giles' remarks did not apply to Scotland, because there were druggists in existence in Edinburgh two hundred years ago. Though he was not there as a defender of the Council, and might differ from them in some respects, he thought Mr. Giles' attack was most unwarranted, and that his remarks were not pertinent to the question before the meeting, because whatever the Council was, it was what the Society made it. The members of the Society looked to the members of the Council to do their duty, and if they found they were not doing what they wanted, they knew what to do when the voting papers came round.

Mr. PATERSON (Aberdeen) thought the educational portion of the report had not received the attention it deserved. Speaking from a part of the country where a large number of apprentices were grown for the benefit of their English friends, he wished to say a few words upon this subject. He most decidedly objected to the first proposition that every man should pass the Preliminary examination before he was entitled to enter his apprenticeship. He did not know what it might be in England, though he always understood that there education was rather behind that in Scotland, but in many country districts there—and they were legislating not only for the cities but for the country also—secondary education was not obtainable, and until a lad had served an apprenticeship under a chemist he was not in a position to get the classical education he required to pass the examination. It would be a great hardship to preclude lads in that position from entering on their apprenticeship. He preferred to take boys from the country even without a classical education, and that they should get it when with him, to having them from the towns, for as a rule they applied themselves better to the business. Again, there were many young men who came into the business in an inferior position, who, by their intelligence, raised themselves and were able to obtain a classical education and become chemists and druggists. There were many members of the Society who had come in as errand boys, with no intention of following out the calling, but who were now very good pharmacists indeed, and had passsd the examinations very creditably. These regulations would put a needless block in the way of such persons in the future, and he thought that if the requisite knowledge were insisted upon before the diploma was conferred, that was all which could fairly be required. In Scotland the period of apprenticeship was generally five years,

never less than four, and if that were to be continued and students were allowed to take the examination when most convenient to themselves, there would be less cramming and more thorough knowledge. The education required should be given during apprenticeship, and each master ought to feel himself bound to see that his apprentice got his education while under his charge. But where were they to get this education? If the Pharmaceutical Society, when it obtained this power from Government, had set itself to give educational facilities in the provinces, they would have had some reason to speak on this matter; but he held they had none. They had concentrated their whole efforts on the central establishment in London and had done nothing for the provinces, and therefore he did not think they were entitled to talk as they did about the deplorable fact of so many young men coming up unprepared. It seemed to him they were themselves greatly to blame for not having encouraged apprentices to acquire their education. If in connection with the Science and Art Department, the Pharmaceutical Society had set itself to promote pharmaceutical education in the provinces, they would not have had this deplorable condition of things, where so many young men were turned back, and they would have had a much better educated class of assistants. They cried out against cramming: but the whole system had led to cramming. In many country districts it was impossible to get teachers paid except in connection with the Science and Art Department. Some of the great London companies were doing a great work in the country by offering prizes and paying teachers to conduct classes in particular branches of study in which they were interested, and it seemed to him that the Pharmaceutical Society might set itself to something of the kind, so as to diffuse education throughout the country; and if they did not the same cry would always be coming forward about cramming, and about imperfectly educated assistants and apprentices. It might be possible for the sons of the gentlemen around him to spend five or ten months in study, but that was perfectly impossible for the great mass of the people—in Scotland at any rate—who joined the trade; and the class from whom they got apprentices could not afford to pay for the education which was now required, unless they could get it on the spot when serving their apprenticeship. The feeling in Scotland was that all this was being done that they might draw cheap assistants to London. He should therefore move, when in order, that there should be no change in the matter of education at present; that apprentices should be allowed to get their education in any way, and come up for their examination as heretofore. The first paragraph in the regulations would impose a great injustice on those who had entered the business, because according to this a lad who had just come out of his apprenticeship, and had not passed the Preliminary, would have to do so, and then spend three years more in a chemist's shop before passing the examination.

The PRESIDENT said there would be four years before the regulation would affect those who were now in the trade.

Mr. LOMAS said one of the objects of the Society was education. That being the case, boys should not be taken as errand boys, thinking they were going to become sufficiently able to pass the examination. All those who were to become pharmacists should receive a good general education before entering on their apprenticeship.

Mr. BROAD thought what had been said by Mr. Paterson with regard to boys entering on their apprenticeship without passing the Preliminary was most illogical. He said an errand boy might be educated by his master to pass his examination; then he would become a master, and how could he educate his apprentices? It was an utterly absurd idea. The Pharmacopœia revision was a point which he felt very strongly on, and he could not agree with Mr. Frazer that it should be entirely in the physician's hands. If the physician wrote a prescription the pharmacist had no right to interfere; but if he wrote, as physicians used to do, and sometimes did now, so and so *secundum artem*, it required the pharmacist to interpret that and to practically make the Pharmacopœia, because the Pharmacopœia really was the mode of preparing these preparations. If physicians wished for a certain preparation of nux vomica, pharmacists told them how to prepare it. With regard to Mr. Giles' remarks about the Council, he was sorry to say that some pharmacists he knew were not content with the calibre of the present Council. Several of them said they did not care about the Society, which was not managed as it used to be, and therefore he thought Mr. Giles was perfectly justified. Mr. Bland attacked the old Pharmacy Act; but he thought it was not to be complained of so much if it were carried out in its entirety, and he should like to see some one appointed by the Society to go round the various districts and see that the Act was properly carried out.

Mr. CROSS (Shrewsbury) said after the remarks made on this amendment by several speakers, and notably by Mr. Giles, he felt that having come some one hundred and fifty miles he ought not to go back without expressing an opinion. He was not vain enough to suppose that he could add much to the force of the eloquence which had been directed against some portions of Mr. Giles' speech, but he was a distinct believer in representation, and he felt that unless they came up from the country periodically to confer with their friends in London, pharmacy would degenerate into a very hole and corner sort of business. It seemed to him most inopportune, when they were concentrating their whole energies on improving the regulations for educating students, that they should be told that after forty years of education the educated men were selecting worse men for the Council than their predecessors did. He believed every member, if he considered the immense amount of work which devolved on the members of the Council, would say that they deserved their heartfelt thanks, and would not accept the statement that some of them were men who were not fit to be associated with medical men. With regard to the publication of the reports in the Journal, it would be most unfortunate to those who resided in the country if they had not an opportunity of reading from time to time what took place in the Council. Mr. Giles said a large sum, which was annually increasing, was spent in the travelling expenses of country members, and intimated that the money was thrown away, but that he must contradict. The more they got the influence of various parts of the country brought to bear on the question of pharmacy, the better the legislation would be for pharmacy as a whole, for it did not exist only in London. In conclusion, he believed that if the country chemists took more political action in pharmaceutical matters they would have fewer of these bickerings which Mr. Giles had referred to.

Mr. ELLINOR (Sheffield) said if it was said that London members should form a larger proportion of a Council he believed the country members would object, and would cease to subscribe; and if, as he believed was the case, the country members subscribed a great deal more than the London members, it must be conceded that they should have the privilege of sending members to the Council. They all knew it was a great convenience to have a sufficient number of London members, in fact, the Society could not be worked without, because emergencies cropped up which could only be attended to by London members. As to their liability, it depended on those who sent them to select suitable members, and he had no fault to find with the present Council. Coming to the question of the Pharmacopœia he thought its compilation should be in the hands both of medical men and pharmacists, and nothing less should satisfy them, because if they had pains and penalties imposed on them, if it was a contract, and the parties named in the contract should be fairly represented. The Pharmacopœia was not a physician's prescription book in the sense Mr. Frazer gave it; it was really a guide and a standard, and there-

fore it was not the production of one man or the invention of one individual practitioner, it was a number of formulæ compiled for the guidance both of pharmacy and medicine, and both branches should be equally represented on the Committee which prepared it. He thought there should be one pharmacist from Scotland and Ireland, and four appointed by the Council, and if six members of the medical profession were joined with them, that would form a committee which would work well. The senior member for Sheffield had charge of the Medical Bill, and it was his intention to appeal to him and put this very vividly before him; and having met Mr. Mundella many times he knew his plan of reasoning, and should have great pleasure in going before him, because he knew he should receive the courtesy of a man of intelligence who was desirous of doing that which would be best for all concerned. As regards apprenticeships, if Mr. Paterson was desirous of taking in these youths, let them have their two years' classical education before they became apprentices. The difference would then be solved. The Science and Art Department lectures were not suitable for pharmacists. It had been found in Sheffield and other large centres that their students would not go to them, because they were of no use to them. He considered that in all large centres there should be schools established, and it should be made the aim of young men to qualify themselves in a sufficient number to give lectures on these scientific subjects. If they were properly qualified they ought to be qualified to teach. The plan had been tried in Sheffield, but failed owing to the want of a sufficient number of students. Lectures had been organized and some members had given lectures, and even provided specimens and materials without charge; but unfortunately the students did not come forward in such numbers as they ought to have done, and even those who received the benefits and were materially aided in their preparation to pass the examinations, though they had afterwards commenced business in the town, had not even joined the Society. This was a thing which was much to be regretted, and was not creditable to the parties concerned. Every one connected with pharmacy ought to be a member of the Society, as the door of membership was now open to them. He hoped the country associations would be better supported by different members in the trade, for it was disheartening to find that in large centres only a few members could be got together when an interesting paper was to be read. They all knew of the case of the citrate of caffeine poisoning, and he should like to ask how far the Adulteration Act interfered with the operation of the Pharmacy Act and the discretion of chemists. The chemist who dispensed that citrate of caffeine was told by the medical man that he ought to have known better than to have given it; but if he had done otherwise in dispensing that prescription, would what he supplied have been of the nature and substance of the article demanded? He had written to the editor of the *Lancet* to ask this question. The reply he had was that his letter would be published in the following number, but it was not published, and he still remained without this important information, which he hoped to have obtained from such a high authority, whether the responsibility which rested on the chemist was or was not interfered with by the Adulteration Act. They had had prescriptions written by medical men taken to an analyst, in order to test the chemist. If a chemist were to be tested by a prescription containing a large dose of poison, say 20 grains of iodide of potassium, when they knew that 2½ grains would sometimes produce very serious effects, and they could not get any information who had written the prescription or what it was for, were they to use their discretion or not? And if they were compelled to dispense it as it was written and any mistake arose, who would be responsible?

Mr. Howard Hall said he rose principally because Mr. Giles had cast some unfounded aspersions, as he considered, on the outgoing Council. He thought they had every reason to be satisfied with the report, which was one of the most encouraging they had had for several years. The income was not only larger by £194 than last year, but it showed a considerable increase on the year 1880, whilst the expenditure also showed a great saving. He was sorry to see the decrease in the number of pharmaceutical chemists, which was a very serious fact which had been alluded to at former meetings, and if it went on the time must come when there would be none left. The number of those who passed the Minor examination showed an increase which was gratifying, and so were the figures in connection with the Journal, which showed a profit of upwards of £400. The question with regard to the surplus was, What did the Council intend to do with it? Could they not improve the character of the Journal? Why should they not improve the character of the Journal? Why should they not spend £100 or £200 more in original contributions and in engravings? Why should they look to America and other foreign countries for matter for the Journal, and why should there be so much reprint from kindred publications? He would ask those who managed it to try and make it a truly representative organ. The travelling expenses of country members had been referred to, and he would ask why should not country members pay the expenses of their representatives in coming up to attend the Council meetings?

Mr. G. W. Sandford asked whether the proposal to change the investments of the Society included the property of the Benevolent Fund.

The President said, Yes; both the Benevolent Fund and the General Fund.

Mr. Sandford said he entirely disapproved of the change, and thought it would not benefit the Society financially; they would have to set up a staff of collectors, clerks, and decorators, and probably get less return for their capital in the end than at present. He remembered perfectly well that this subject was discussed in Council whilst he was a member of it over and over again, and was always decided in the negative. There were great difficulties in the way; in the first place, by the Charter they could not invest more than sufficient to yield a certain income in property, and they could not at any time sell or dispose of that property without calling a general meeting of the Society. He feared these difficulties had been scarcely calculated on in coming to this resolution; he should make no motion about it, but he felt it his duty to leave a protest on the records of the Society that he thought it bad on principle and most unwise. With regard to the question of pupilage he was quite of opinion that a preliminary examination should be passed before any youth was taken into a pharmacy at all, but he wished to know whether the regulation meant that he must spend three years in one special shop; the words would seem to imply that he must enter upon his apprenticeship immediately after passing the Preliminary examination, though that perhaps was not intended, and also that he should pass the three years in one shop.

The President said that was not the intention.

Mr. Stacey entirely endorsed Mr. Sandford's view with regard to the proposal to alter the investments. He would not detain the meeting further on the education clauses, though there were many points he might raise a serious objection to. He thought the scheme was incomplete and wanted more consideration, and was sorry it had come forward in this report in the form it had. He should, therefore, have been glad if these two parts of the report could have been referred to the incoming Council. When Mr. Paterson referred to the first and second clauses in the educational part of the report, the President corrected him in his reading, but it seemed to him very clear that the young man was to pass his Preliminary examination before he could take up his apprenticeship, or become a pharmaceutical student. Mr.

Martindale had referred to youths being apprenticed at sixteen, and having four years before they need go through the curriculum, but he thought he had lost sight of the possibility of a parent wishing his son, who might have attained the age of eighteen, nineteen, or even twenty, to become a pharmaceutical chemist, and he thought it would be a pity to throw any difficulty in the way of those coming forward later in life.

Mr. HUMPAGE said he very much respected the opinion of Mr. Sandford, but with regard to the change in the investments, it appeared to him that when they had twenty-one men on the Council, men of intelligence and judgment who had the interest of the Society at heart, he could not suppose they would do anything unjust, and, therefore, when they came forward and said it was their intention to do so and so, he must confess, individually, he felt more confidence in what they proposed than in what outsiders might think. With respect to apprenticeship, he was decidedly of opinion that three years was not too long; in fact, it was not long enough. It was said that young men of genius were prevented from qualifying themselves and going into business early; but he had never known an exception to this rule, that when a young man had been able to pass the examination young, and go into business at an early period, he regretted afterwards he had not waited a few years longer, therefore anything which tended to defer the time of entering business was rather an advantage than otherwise.

Mr. RICHARDSON said he wished to say one word in answer to the cruel remarks of Mr. Giles—

Mr. GILES said he had not said a word which reflected on a single member of the Council. He was himself a member of the Council in 1853, and thought he was entitled to be there; but it would have been a deplorable thing if the Council had consisted of twenty-one R. W. Giles's. All he had said was, that whatever the claims of any one individual to represent any one locality might be, it was a pity that the calibre of the Council did not, as a rule, stand as high as it did twenty-five years ago.

Mr. RICHARDSON said it was a great pity that Mr. Giles should have retired from the Council at all; he was sure its calibre would be sustained by his eminent presence, if he would return to it. He should be very sorry to sit there as an exhausted volcano, and to have such strictures passed on their efforts to represent the great body of pharmacy, and he did take exception to Mr. Giles's dictum as to the members of the Council being selected exclusively from the London members of the trade. The country members constantly complained that they were not properly represented, and the town members did not thoroughly understand the method of conducting business which their country brethren had to go through.

The VICE-PRESIDENT said he would not say much with regard to what Mr. Giles had said as to the composition of the Council. He had now made a further explanation which did not, however, much affect the matter. Of course he did not say anything with regard to any particular member. He had too much respect for Mr. Giles's reasoning powers, as well as for his knowledge of the history of pharmacy, to question much that he had said, but he did take exception to his view of the position of the Council. No doubt in those glorious old days of the past, to which they were always poetically referring, there was the grand array of heroes to which he referred, but as he belonged to the unknown class, he could very fairly point to the President, and was quite ready to compare him with any man who had gone before. If there was a good all round man, not simply a scientific man, but one capable of representing the Society anywhere and with anyone, it was the President. It would be a great pity if the question of town and country were ever raised with regard to representation. Both great sections of pharmacists had their fair claim to representation, and he thought the present condition of things was relatively perfect. Those in the country felt that they owed a debt of gratitude to the London members, some of whom, like the President, were almost entirely absorbed with the work of the Society. There was often work which required prompt, immediate and urgent action, which must be taken in hand before members could be summoned from the country. The country pharmacists were fairly represented in quantity, whatever might be said about the quality, and the London members were most ably represented. He emphatically disclaimed the idea that the Society did not originally contemplate the protection of the trade. There were three things set forth at the foundation of the Society; and they were all included in the charter; education came first and a long way in advance of any other, but then came the protection which every incorporated body did contemplate, and, thirdly, benevolence. The two great points in the Report seemed to be these: Pharmacopœia revision, on which there seemed very little difference of opinion; but he wished to express his view very distinctly that they should ask for nothing less than a co-ordinate power in the preparation of the Pharmacopœia. He did not mean a departure from the existing lines by certain individuals eminent men being asked to assist, or that the Medical Council should come and ask them as a Council for assistance, although that would be a great gain, but they wanted the Legislature to enact in some Bill that in the preparation of the Pharmacopœia pharmacists should have a co-ordinate power. With regard to the curriculum, so much had been already said that he would only add that their object as a Council was not to place additional difficulties in the way of students entering the calling. The fundamental thought was this, to facilitate the progress of all duly qualified young men, and it was because they had seen so large a percentage of failures arising from want of due preparation that this scheme was devised. They could not legislate for exceptional cases or for genius, but for average men. Some charges had been made by previous speakers against the Society for not fostering provincial associations and providing the means of pharmaceutical education in the country; but as long as he could remember, one of the great things which had been constantly urged in the Journal and talked about in the Council meetings was the fostering of such associations. They had always said, let the schools be formed and they shall receive assistance, and that was what they said now. There were a few very valuable and flourishing organizations in the country, but not so many as he should like to see.

Mr. Vizer's amendment was then put to the meeting and lost by an overwhelming majority.

Mr. PATERSON then moved the following amendment:—

"That no change in the examinations be made at present."

When speaking before, the President said that the rights of present apprentices would be respected, but he would call his attention to the last note in the transactions of the Journal of March 10, 1883, which seemed to indicate that those at present in the business, unless they passed the Preliminary before the end of the present year, would have to do so, and then under this regulation go back for three years' apprenticeship, which would be a great hardship and ought not to be inflicted on anyone. He did not object to the educational standard at which they were aiming, and all he wanted was they should not shut the door against possible candidates without any good being effected. When he spoke of errand boys, he did not mean that they were to take every errand boy and make him a chemist; but if an errand boy showed exceptional ability and perseverance, why should he not be allowed to go on and pass his examination without requiring him to spend a length of time, which people in his circumstances could very ill afford. With regard to provincial education, in Aberdeen a fully equipped school of pharmacy was started and they applied for a grant from the Society, the result of which was they were offered the liberal donation of a

loan of £10 worth of glass instruments to be returned in the same condition three years afterwards. Under the Endowed Schools Act they had been able to get over all the difficulties; they had a large and growing technical school, and at the request of the Association the college had taken up the matter of pharmaceutical education and was giving both the classical and technical education necessary for chemists. He therefore spoke in no sense as seeking anything for Aberdeen, because they were thoroughly provided with the means of education, and he therefore felt more freedom in speaking for those parts of the country which did not enjoy the same privileges. It was a great hardship on lads who were not in the same position to get the education necessary that they should be put to the trouble and expense which this proposed curriculum would impose upon them. Mr. Ellinor said the instruction given by the Science and Art Department was not suitable for their students; this he was quite aware of, but why should it not be made suitable? A plan had been suggested which would meet the difficulty, namely, that those who came up to London and completed their studies should return to the country and give lectures, receiving from the Science and Art Department that remuneration which they would not otherwise obtain. He wanted to see education brought to the doors of the young men as far as practicable, and when that was done, he saw no reason why examinations should not also be held locally. In Aberdeen, doctors could receive their diploma, and he did not see why medical men should be sent out to prescribe and at the same time their apprentices could not be qualified to dispense their prescriptions.

Mr. CANDY seconded the amendment.

Mr. WHITTLE did not think it expedient to have errand boys turned into chemists. He believed what these gentlemen wanted was cheap labour.

The PRESIDENT said this question had been thoroughly discussed over and over again for several years, and he would therefore now put the amendment.

The amendment was put and lost, and the original motion adopting the Report of the Council was then carried almost unanimously.

Mr. SANDFORD then moved the following resolution of which he had given notice, namely:

> "That in the opinion of this meeting certain provisions set forth in the proposed Bill to regulate the Sale of Poisons and alter and amend the Pharmacy Acts require alteration, especially clauses 4 and 5, which render retail vendors of patent or proprietary medicines who have not and cannot have any control over the required labelling of such medicines liable to prosecution for insufficient labelling, for which offence the proprietors only should be and can be made responsible."

It might seem that having been so long associated with his friends on the Council, to which association he looked back with great pleasure, that he should be very chary in finding fault with anything they had done; but he felt that he had a duty to the Society as well as to his old friends on the Council, and if members joined him in this protest against what he considered a most unjust proposition, the Council would be relieved from a great burden, because if the thing passed as they proposed it, it would be a perpetual blister, and a very ill reflection on those who framed the measure. The President had said that the Bill had been framed somewhat in obedience to the wishes of the Government. No doubt it was framed at the request of the Government, but it was framed by their own Council, and while it should be framed to fully protect the public from all harm which might arise from neglect, it should be so framed as not to inflict on chemists and druggists, whom he might call innocent persons, a great hardship. The first objection brought forward to his proposal was the necessity for proving the purchase; but the necessity for proving the purchase of a patent medicine did not exist as it did in the case of an ordinary poison, inasmuch as patent medicines were not purchased for criminal purposes. They did sometimes inflict mischief by careless use, and sometimes he was afraid they were used as intoxicants, at all events they got a character of that kind, and it was on that particular point the Government were anxious to have restriction. He remembered a case in which a prosecution was instituted, in the matter of Hunter's chloral, for instance. Another objection put forward was that chemists in selling poisons should be treated as grocers and all other people were in the sale of adulterated articles, but he submitted that the two cases were entirely different. The man who sold adulterated mustard or jalap was supposed to be a man educated for his business and to know when he handled his mustard or jalap what he was handling. Therefore, if a qualified man sold an ounce of jalap which was adulterated he became *particeps criminis*, and should be punished accordingly; but not so with a patent medicine which was sealed up. If he opened the packet he destroyed the seal, and therefore he had no means of knowing whether it was labelled "poison" or not, and in many cases there were no means of knowing whether the article contained poison or not. If this Poison Bill were passed for patent medicines there would be a greater tendency than ever to send out patent medicines containing poisons without a label of that kind, because the word "poison" would to a great extent hinder the sale of a patent medicine, and therefore chemists would be placed in more direct danger, since if the maker did not describe it as poisonous, they did not know that it was so and could not open it and examine it. He regarded the seller of a patent medicine simply as a postman delivering a sealed letter. Then they were told that the retailer must be immediately attacked, because it was difficult to get at the proprietor. He said it was not; every patent or proprietary medicine had on it the name of the proprietor, and if you could not get at the proprietor of the medicine, how were they, who had been fined, to get at him to be reimbursed. They were to be fined £5 for selling a patent medicine improperly labelled, and their names would be sent forth to the world as having been convicted of an offence, which was not pleasant. They would know amongst themselves that it was no offence, but the world outside would not know it. The sixth clause provided that they could recover from the person from whom they bought, either from any intermediate seller, or from the proprietor, and this would lead to a nice little crop of law suits. Then again, they were to recover from the proprietor the amount expended in the penalty and costs; but he should like to ask what would be done in such a case as this. If he committed a first offence in the selling of Hunter's chloral, he would be fined £5; a month after he might commit another offence by selling somebody else's patent medicine improperly labelled; that would be a second offence, for which he might be fined £10. But would the proprietor of the second medicine have to reimburse him his £10 and the expenses he had been put to in the matter; it would certainly be a great hardship on him if it were so. If he could canvass the Council individually he believed they would agree with him that this clause should be struck out. It was perfectly easy; he had a clause written which would make it easy at once to attack the proprietor. He knew there was something said about patent medicines or proprietary medicines brought from abroad, but he would provide for that by enacting that every maker of a patent or proprietary medicine in Great Britain or Ireland should mark it with his name and address and the word "poison" or "dangerous," or whatever was required, and he would have the same requirement on every importer of foreign medicines of the same character. There were one or two other blemishes in the Bill, but this was the most important, and he thought it would be best to confine themselves to this point first.

Mr. URWICK seconded the motion.

Mr. MACKENZIE was delighted to see the position taken up by Mr. Sandford, and had great pleasure in supporting it, for he had objected to this all along as being most unfair. He believed the clause would never pass the House of Commons in its present form, but he hoped every individual would bring his personal influence to bear to get all that was good in the Bill and expunge that which was objectionable. If it were passed as at present it would be a constant source of irritation. Whatever went to Parliament it should really do what it represented, and he remembered a case where a Bill was turned out because it did not correspond with its title. Was it right that sulphuric acid should come under the class of things no longer to be labelled "poison," but only "poisonous"? It would look like changing the meaning of words, and that was a precedent which ought not to go from that Society.

The PRESIDENT said he would appeal to the meeting if it were at all likely that twenty-one members of Council would deliberately tie their hands by any proposition unless there were good grounds for it. He had before him the clauses which Mr. Sandford referred to, about importers and so on, and he seemed to think it was a very easy matter. But not having so much perception gained by long experience as Mr. Sandford, he failed to see how the clauses he had drawn would meet the case. If the sale of poisonous patent medicines were to be restricted to registered persons these clauses would not meet the case. If they did not want any responsibility whatever they must leave the patent medicine poison question altogether; but they desired that the sale should be restricted to registered persons, and they had had requests from other bodies that they should be so restricted. If this were so some responsibility must be thrown on the seller. Why should the chemist and druggist be allowed to sell these things without any responsibility at all? It was out of harmony with all previous legislation. It might be desirable not to touch the patent medicines containing poisons, but the subject was not one to be dealt with off hand in that way. With regard to the penalties, Mr. Sandford certainly had a case. A cumulative penalty might probably prove inconvenient and could easily be struck out. But some of them had had experience in working out the provisions of the existing law, and knew how difficult it was to carry out the Act satisfactorily. Their object was to draw clauses which when passed should work. But supposing Mr. Sandford disapproved of their action with regard to all poisons and became a disconsolate member of the drug trade and retired to Boulogne, what was there to prevent his inundating the whole of this country with poisonous patent medicines through an assistant at Folkestone having his name, "George Webb Sandford, Boulogne-sur-Mer," on every package? He was the proprietor, and how was he to be approached. You could not summon a man who lived at Boulogne, because he was out of the jurisdiction. It was the commonest thing for men who owned proprietary medicines which were not allowed to be imported into a foreign country to go there, make them, and put a label on the article with their proper domicile, and persons anxious to create a trade in poisonous patent medicines would adopt some such plan for evading the law. It was because they were advised that they could not satisfactorily deal with such cases and further reasons that this dreadful clause six was put in the Bill. It seemed very hard that when a man sold a patent medicine improperly labelled he should be fined; but he thought it necessary that pharmacists should exercise judgment even in connection with these patent medicines, if they claimed to have the exclusive right to sell them. While he objected to anything which would tend to involve anyone in law suits, they knew that the patent laws could only be worked on the basis that the person who sold the article which was infringed was made liable. No doubt in this case the damage to the reputation of a chemist was greater than that to an ordinary tradesman who infringed a patent, and he was willing to meet Mr. Sandford as far as possible; but he could not see his way to draft a clause which would meet all the difficulties which would crop up. He, therefore, asked members to place confidence in the Council and not to run away with the notion that they were to be sacrificed for a mere whim. As regards importation, Mr. Sandford said the importer should have his name on the medicine; but who was the importer? Every one in the room might, at some time, import a foreign patent medicine, but he did not consider himself the importer. Mr. Sandford would, no doubt, consider that one particular person was the sole importer of any particular article; but that would never be so in the present condition of trade. Some men would send to New York or Philadelphia and give their orders direct, while others would obtain the medicine through Barclay's, or some other wholesale house. The practical working of it would be that whenever a man bought a new patent medicine about which he had the slightest suspicion, he should ask whether it contained poison, and the large patent medicine houses would decline to touch anything which contained poison unless it were declared so, in order that they might be protected, and it would be for the good of the public that it should be so.

Mr. HAMPSON asked if Mr. Sandford would be satisfied if this clause were remitted to the Council for re-consideration. There would then be an opportunity of reviewing the matter, and if it could be amended with the help of Mr. Sandford, they would all be glad to do so. The view presented by the President was quite as strong as that presented by Mr. Sandford, and he believed those who prepared these articles would find it to their interest to conform to the law, whatever it might be.

Mr. LONG said the difficulty would be this, he might be asked for a box of Snook's Pills or Thompson's Elixir and supply it; then the next day he might hear that the person had died, and that might be the first he knew that the article contained poison. It was a pig in a poke altogether. He did not see why they should have a Bill which put a yoke on their own necks. If they knew an article was poisonous they would conform to the regulations. Supposing a manufacturer forgot to label a bottle by accident, the chemist would be liable to a £5 penalty.

Mr. JOHNSON asked if this Bill were carried would the Pharmaceutical Society undertake to define what patent medicines required the name and address of the seller, otherwise they would not find out until after an accident happened whether it contained poison or not.

The PRESIDENT said there were various ways in which the Society might protect the members, and it would, no doubt, be willing to do so.

A MEMBER asked if it was not possible to make manufacturers register the contents of their medicines.

The PRESIDENT said that might be possible, but then there would be the difficulty with importations.

Mr. CHRISTOPHER WHEELER said there were numbers of things constantly coming out which were not patent medicines, but only nostrums covered by a Government stamp. If it was the duty of anybody to put on the poisonous label it should be the manufacturer. They should not put the saddle on the wrong horse if they could help it. He believed there was no such thing in the country as a patent medicine; they were all secret nostrums, and the maker of the nostrum, if it were dangerous, should be compelled to label it.

Mr. URWICK asked if a medical man prescribed Fellows' Syrup, would it be necessary to mark it poison.

The PRESIDENT said not when it formed part of a prescription. If they sold an original bottle of any preparation containing poison without a label, it was a question whether, under the existing law, they were not liable to be fined.

Mr. JOHNSON said he had had a prescription simply "one bottle of Fellows' Syrup"; how was that to be dealt with?

The PRESIDENT said his opinion was that in such a case if the preparation contained poison that it should be labelled.

Mr. ALLEN said if they were to ask for legislation sanctioning the making and vending by unqualified men of poisonous preparations, they were going altogether from their position.

Mr. HUMPAGE thought the matter had better be referred back to the Council with the assistance of Mr. Sandford.

Mr. SANDFORD said, seeing what the Council had done in the matter, he was not inclined to leave it in that way. It had with its eyes open committed a great blunder, and proposed inflicting a great hardship on the trade. This was not a proposition by the Government, it was the proposition of the Council itself, and they should not leave the room without an expression of opinion that it was disapproved of. The President had spoken of an Englishman going to France, and then sending his patent medicine to England, but it then became at once an imported article.

The PRESIDENT said that was not the case he put, but of an Englishman making the preparation in England, but residing in France.

Mr. SANDFORD said that would be a very exceptional case. They were asked if they were not to give some equivalent. An equivalent for what? for confiding to the qualified body the sale of those patent medicines which contained poison, not patent medicines generally, but simply those which were dangerous. Was that to be an equivalent for subjecting themselves to such penalties and disgrace as might be brought upon them by this clause? It was altogether unreasonable. He had prepared a clause that would take the place of clauses 4, 5 and 6, and be just as much protection to the public, whilst it would not expose chemists and druggists to what they were now threatened with. He hoped the members would support his motion.

Mr. SCHACHT asked whether the resolution, if adopted, was to be a direction to the Council to make a new clause in accordance with the motion.

The PRESIDENT said it would be the opinion expressed by the meeting that it was desirable the clause should be amended. They could not do more than that.

Mr. SCHACHT asked if the next General Meeting might not think it rather hard if they were told that the resolution could not be carried out. Yet that was really the position. The matter had been very carefully considered and the Council did not see the possibility of doing what was desired.

Mr. WILLIAMS said he should not have spoken, but for what had fallen from Mr. Schacht. But he must now be allowed to say that throughout he had been in opposition to the majority of the Council on this point. He thought Mr. Sandford's proposal was the right and reasonable one.

Mr. HAMPSON said that he would move an amendment—

"That the clause be remitted to the incoming Council for further consideration."

Mr. SANDFORD thought it was unfair to move an amendment after he had replied.

The PRESIDENT said it was quite in order to move an amendment before the resolution was put.

Mr. HAMPSON said his amendment was very much in harmony with Mr. Sandford's proposition. The clause had not been framed without considerable care, and very full legal opinion had been obtained. He was quite sure the incoming Council would bear in mind the strong expression of opinion which had been given against the clause as it stood, but he was quite prepared to go into the whole question again.

Mr. REES seconded the amendment. He thought the resolution would only have the effect of facilitating the general sale of patent medicines wholesale by everybody. If everybody were allowed to sell poison in the form of patent medicine, why not sell it in the form of a vermin killer? That was why it was proposed to restrict it solely to chemists. He thought the dilemma which it was said they would fall into was purely imaginary. If the proprietor of a patent medicine was made to pay one fine he would take good care not to incur the penalty a second time.

Mr. SANDFORD said they knew the next Council would be almost identical with the present, and he was not prepared to leave it to the next Council without a strong vote on the part of the meeting, as a message to the Council to the effect that they would in every way oppose a Bill containing such a proposition if it were placed before Parliament.

The amendment was then put to the meeting and lost, the votes being 46 in favour of it, and 49 against.

The resolution as moved by Mr. Sandford was then put and carried.

Mr. SANDFORD said there were one or two other clauses in the Bill which required notice. In the clause referring to persons having more than one shop, he would strike out the word "branch," and insist on every man who kept more than one shop having a qualified assistant in each. You could not tell which was the branch shop and which was the parent shop. The proprietor must leave his shop to go to the branch, and it might become a question which was the branch shop and which was the other. One other point was that clause 3 did not go sufficiently far; it was framed after the trial and conviction of Lamson, and it was thought desirable to prevent such offences in future. The clause as it stood might perhaps bring a murderer to justice, but it would not prevent a murder. What they wanted was certain power, which some exercised already, to prevent the sale of certain potent drugs on personal application to men pretending to be doctors. He did not in any way wish to affect wholesale dealing in the ordinary acceptation of the term. To give an instance, a man came into his shop not long ago and ordered a very strong preparation of morphia. He happened to see the prescription, and asked to see the person who had ordered it; he was told the man had written the prescription on the counter, and was going to call for it. He told the assistant not to let him have it, and when the person called he told him he could not sell such a medicine as that to a stranger; the reply was, why did they take the order? He said because it was thought he was a medical man, which he at once disclaimed, and that was just the difficulty. Some people did not like to offend an apparently respectable man, and therefore he would give them the same kind of authority as they had for selling the articles in Part 1 of the Schedule, namely, requiring personal knowledge or introduction. He thought it would be a great relief to chemists generally if they had that kind of authority for refusing to sell to a stranger two grains of aconitine or strychnine; he would not interfere with morphia or opium, because it would sometimes be very inconvenient. The clause for keeping orders for twelve months would still remain in force. He was told that this might be a great hardship on a medical man who was called into a country town, and wanted to give a patient aconitine. Such a thing would scarcely ever happen, and if it did, the medical man would have been summoned by someone in the town who would be known to some chemist, and would vouch for the medical man who wanted the article.

Mr. MARTINDALE agreed that the word "branch" might be omitted, but he thought the last proposal would be impracticable. Would Mr. Sandford apply it to hypodermic injections. He thought they ought not to make laws to meet particular cases; the end desired would be much better met by requiring medical men to write their

orders on a printed form, giving their name and address, so that the chemist might know who was the prescriber. He knew it was a rule of the College of Physicians that a physician should not sign his name in full to a prescription, but he thought the rule was very absurd, and that the public safety should override such regulations.

Mr. SCHACHT, referring to the resolution already passed, said he did not feel at all pleased at the prospect of having to alter the clause in accordance with the instructions the meeting had given, because, as far as he could see, it could not be altered. He would suggest that the meeting should appoint a small committee to confer with the Council to see whether it could be done, his opinion being they would find, on investigation, that it could not. What was the offence which was to be punished? The offence was the retailing of the poison, and that was not committed by the manufacturer.

Mr. SANDFORD said it was out of order to raise the question again.

Mr. SCHACHT said he thought it was quite regular in order to carry it out that a committee should be appointed.

Mr. UMNEY seconded the proposal; it would be very unwise to come to any hurried conclusion in the matter, and it would be far better to appoint a sub-committee consisting of three gentlemen, to confer with the Council.

Mr. SANDFORD said his resolution was that the clause, as drawn, should not be carried out to make the retailer responsible; there was no difficulty whatever about it, and no occasion to appoint a committee. It would be quite useless to appoint three gentlemen to meet twenty-one.

The PRESIDENT said he agreed with Mr. Schacht's proposition, but he thought perhaps it would be better not to press it.

Mr. SCHACHT said he thought such a committee ought to be appointed, and he would move that the Committee consist of Messrs. Sandford, Umney and Martindale.

Mr. SYMES asked Mr. Schacht to withdraw the resolution; almost everyone present had discussed the matter, the Council was fully in possession of the opinion of the meeting, and would no doubt do its utmost, notwithstanding what had been said about the impossibility, to bring the clauses to which attention had been drawn as far as possible into conformity with Mr. Sandford's wishes. He rather regretted that while Mr. Sandford would release the trade from one difficulty he should try to saddle them with two more, because such a regulation as he had just suggested would be of no use unless surrounded by pains and penalties.

Mr. FRAZER wished Mr. Schacht would withdraw the motion.

Mr. SCHACHT said though a great many opinions had been expressed in favour of Mr. Sandford's resolution, the view on the other side had only been put forward by the President, and though he might accord in what had been said, the whole of the case had not been stated. He therefore thought it better to have a small committee, who should have an interview with the Council and hear what could be said on the other side.

Mr. SANDFORD said he could not sit on the committee, as he did not now reside in London.

Mr. GILES said supposing the committee were formed, and were to come to a new conclusion, how was the resolution to be carried out.

Mr. WILLIAMS asked to whom the committee were to report.

The VICE-PRESIDENT said he was quite sure the incoming Council would respect the opinions which had been expressed. It was always an unpopular suggestion to make that the *vox populi* at a public meeting was not always the *vox Dei*, but such might be the case. He had no particular affection for the clause, and was quite willing to go into the whole matter again; but if having done so, the Council failed to alter its deliberate opinion, he feared some members might think it had played them false.

Mr. EKIN was afraid the Council would be rather open to that imputation; the vote was very close, and on that ground he would urge that the Committee should be appointed, and also to save the Council from any imputation of falseness. Certain members of the Council said it could not be done, whilst Mr. Sandford said it could; if, therefore, a committee were appointed to confer, it would save the Council from the responsibility of refusing to carry out the resolution.

Mr. STACEY said the resolution had been passed, and he thought it was the duty of the Council to carry it out. He was sure the Society would not feel that confidence in the Council which they ought if the Council imposed such burdens upon them as that they should pay for other people's faults.

Mr. HAMPSON said that supposing after consulting their legal adviser and taking counsel's opinion they were told that a clause such as Mr. Sandford desired could not be framed, what should be done then?

Mr. SANDFORD said he should laugh at any counsel's opinion to such an effect. This clause was nothing but one for the multiplication of law suits.

Mr. CANDY asked if Mr. Sandford could make an alternative proposition. The resolution had been carried only by a narrow majority, but if it represented the sense of the meeting, the meeting ought to take some steps to assist in carrying it out.

The motion for the appointment of a committee was then put and negatived.

Scrutineers of the voting papers were then appointed.

The Registrar laid on the table the various Registers as required by the Act of Parliament.

Mr. SANDFORD moved a vote of thanks to the President and Council, who he was sure had worked most heartily for the good of the Society during the past year.

Mr. GILES seconded the motion, which was carried unanimously.

The meeting was then adjourned until Friday, the 25th inst., at twelve o'clock, to receive the report of the Scrutineers.

ADJOURNED GENERAL MEETING.

Friday, May 25, 1883.

MR. MICHAEL CARTEIGHE, PRESIDENT, IN THE CHAIR.

The adjourned meeting for receiving the report of the Scrutineers was held on Friday, May 25.

Mr. HOPKIN, as Chairman of the Scrutineers, in presenting the report, remarked that although the number of voting papers received this year was slightly in excess of that of last year, nearly two-thirds of the Members and Associates in Business had failed to exercise their right of voting in the election of Members of Council.

The SECRETARY stated that failures to return voting papers were about equally distributed among the three classes of Pharmaceutical Chemist and Chemist and Druggist Members and Associates in Business.

The following is the—

SCRUTINEERS' REPORT.

We, the undersigned scrutineers, appointed at the Forty-second Annual General Meeting of the Pharmaceutical Society of Great Britain, do hereby certify that we have examined the voting papers committed to us, and report the following:—

Voting papers reported by the Secretary to have been issued	3662	
Voting papers received	1370	
Voting papers issued but not returned		2292
Voting papers received		1370
Voting papers disallowed:—		
Informal	18	
Received by post too late	47	
	—	65
Voting papers registered		1305

Result of the Poll.

Bottle	1199	Radley	1077
Symes	1193	Butt.	1053
Hampson	1183	Richardson	1036
Atkins	1178	Andrews	1016
Savage	1172	Borland	965
Woolley	1137		
Carteighe	1130	Baldock	689
Hills	1103	Young	630
Robbins	1103		

W. K. Hopkin, *Chairman.*

Charles J. Mead	T. Howard Hall.
Robt. Rowe.	Robt. Saml. Bathe.
T. E. Greenish.	Chas. B. Allen.
Jno. T. Tupholme.	Alfd. E. Tanner.
Wm. Matthews.	Edwd. B. Stamp.
Wm. F. Gadd.	George S. Taylor.
W. Murton Holmes.	W. H. Symons.
J. S. Ward.	Henry Mathews.
I. Bourdas.	William Gulliver.

The New Council.

The Chairman then declared that the following gentlemen would constitute the Council for the ensuing year:—

Andrews, Frederick, 34, Leinster Terrace, Hyde Park, W.

Atkins, Samuel Ralph, Market Place, Salisbury.

Borland, John, 7, King Street, Kilmarnock.

Bottle, Alexander, 37, Townwall Street, Dover.

Butt, Edward Northway, 13, Curzon Street, Mayfair, W.

Carteighe, Michael, 180, New Bond Street, W.

Churchill, Walter John, 46, New Street, Birmingham.

Gostling, Thomas Preston, Market Hill, Diss.

Greenish, Thomas, 20, New Street, Dorset Square, N.W.

Hampson, Robert, 205, St. John Street Road, E.C.

Hills, Walter, 225, Oxford Street, W.

Radley, William Valentine, 42, Hampton Road, Southport.

Richardson, J. G. F., Elmfield, Stoneygate, Leicester.

Robbins, John, 147, Oxford Street, W.

Savage, William Dawson, 4, Park Road East, Brighton.

Schacht, George F., 52, Royal York Crescent, Clifton, Bristol.

Squire, Peter Wyatt, 413, Oxford Street, W.

Symes, Charles, 14, Hardman Street, Liverpool.

Williams, John, 16, Cross Street, Hatton Garden, E.C.

Woolley, George Stephen, 69, Market Street, Manchester.

Young, James Robertson, 17, North Bridge, Edinburgh.

Auditors.

There being only the requisite number of candidates (five) for the office of Auditors, the Chairman declared the following duly elected for the ensuing twelve months:—

Hodgkinson, William, 198, Upper Whitecross Street, E.C.

Lescher, Frank H., 60, Bartholomew Close, E.C.

Stacey, S. Lloyd, 300, High Holborn, W.C.

Thompson, Henry A., 22, Worship Street, E.C.

Watts, William H., 32, Lower Whitecross Street, E.C.

Chemists and Druggists' Trade Association of Great Britain.

The seventh annual meeting of this Association was held on Tuesday last. The proceedings commenced with the meeting of the Executive Committee at 11, when the chair was taken by Mr. R. Hampson. He announced with regret that Mr. Haydon, the Secretary, was unable to be present from illness.

The Report which had been printed was taken as read.

The Annual Report.

The Report commenced by stating that acting under the instructions of your Committee, the Solicitor and Secretary had considered numerous cases of illegal trading in poisons. Proceedings had been taken during the past year by the Association, under the 17th section of the Pharmacy Act, against nine persons residing in London, Halifax, Nottingham, Northampton, and Hyde, for having sold poisons improperly labelled, the evidence for which was obtained by the Assistant-Secretary. A fine was in each case inflicted by the magistrates, varying in amount from one shilling to five pounds. The proceedings at the hearing of these cases were fully reported in the trade journals. The Secretary had also reported several cases of illegal trading under the 15th section of the Act to the Secretary and Registrar of the Pharmaceutical Society, in one of which a fine of £5 was inflicted.

Two cases of prosecution under the Sale of Food and Drugs Act had come under the notice of the Committee during the past year. In one, a member of the Association was prosecuted for having sold, to the prejudice of the purchaser, two ounces of mustard which was not of the nature, substance, and quality of the article demanded. It was ascertained that the inspector had asked for mustard, and had been supplied with Colman's mustard condiment, no label being affixed to the packet sold; it was, therefore, decided not to defend the case. In the second case a member was summoned to appear before the Longton magistrates for having sold lime water not of the nature, substance, and quality of the article demanded by the purchaser. From information obtained, and acting on the recommendation of the Analytical Referee of the Association, who had analysed a sealed sample of the lime water in question, the Law and Parliamentary Committee declined to defend. These had been the only prosecutions under this statute which had been submitted to the Association since the issue of the last report, but it was claimed that the prompt action of the Association in defending every legitimate case that had from time to time arisen, had tended to stamp out the frivolous, though very annoying, proceedings under the Act which were so frequent in the early days of its existence.

A member of the Association residing at Handsworth, Staffordshire, had been proceeded against, under the Weights and Measures Act, for having certain weights in his possession which were below the standard, and a grant of one guinea had been made towards the expenses of defending on the grounds that the usual notice of the intention of the inspector to examine the weights of traders residing in the defendant's district had not been given. A merely nominal fine was inflicted by the Bench.

A member of the Association having been threatened with an action by the proprietors of Jenner's Liver Mixture, for having made use of the title "Liver Mixture," the Committee had ordered the Solicitor to defend on the grounds that the words "liver mixture" have been for many years in common use in the trade, and that it is not advisable in the interest of the members that any person or firm should establish a monopoly over such common trade terms. No writ had, however, been issued and it was concluded that the proprietors of the

trade mark now deemed it inexpedient to appeal to the law.

A member of the Association having been threatened with an action for damages for having improperly and unskilfully treated the cut finger of a child, the Executive had arrived at the decision that the chemist had not in any way exceeded the legitimate bounds of his business, and therefore instructed the Solicitor to defend the case if proceedings were commenced. Up to the date of the Report no writ had been issued.

The Committee had carefully considered the Pharmacy Act Amendment Bill, 1883, prepared and printed by the Pharmaceutical Council, and the following suggested amendments had been transmitted to the Secretary of the Pharmaceutical Society, viz :—

Clause 2.—"That the whole of this clause be erased, and that the articles in the special schedule referred to in the clause be added to part 2 of Schedule A, to the Pharmacy Act."

Clause 4.—"Insert the word 'and' after the word 'contained' in the twenty-eighth line, and the words 'the name of the poison contained therein' after the word 'medicine' in the thirty-first line."

Clause 9.—"Add the words following at the end of the clause, viz. :—Notwithstanding the provisions of Section 16 of the Pharmacy Act, 1868, or of this Act, it shall not be lawful for any executors, administrators, or trustees of a deceased pharmaceutical chemist, or chemist and druggist, to continue the business of such pharmaceutical chemist, or chemist and druggist, for a longer period than three years, unless by permission of the Council of the Pharmaceutical Society of Great Britain."

Insert in the Bill a clause to the following effect :—

"Every person registered, or who shall be registered under the provisions of the Pharmacy Act, 1852, or of the Pharmacy Act, 1868, as a chemist and druggist, and who shall be in business on his own account, shall be exempt from serving on all juries and inquests whatsoever."

A committee had also been appointed to take such steps as might be deemed desirable to carry out the wishes of the Executive in amending the Bill. Whilst offering these suggestions to amend the Bill, the Executive expressed an earnest hope that on the introduction of the Bill into Parliament the whole trade would cordially unite in supporting it, so that it may obtain the sanction of the Legislature.

After referring to the Medical Act Amendment Bill now before Parliament, the Report mentioned the meeting of the London members of the trade, held in December last, the proceedings of which were reported at the time in this Journal.

In accordance with the request expressed at the last meeting of the General Committee held in London, the Executive had appointed local secretaries in all towns in England or Wales containing six or more registered chemists and druggists. A list of the names of these gentlemen appeared as an annex to the Report. The appointment of local secretaries in Scotland had been postponed until the Committee of the Scottish Branch had made recommendations for these posts, and the appointment of local secretaries to the Metropolitan districts had been relegated to the London Committee.

The Committee of the Scottish Branch of the Association in July last having ascertained that an application was about to be made by the Edinburgh University Court to Her Majesty in Council, for powers to make attendance at this University in practical classes in physiology, pathology and materia medica imperative, and that the instruction accepted as equivalent to a course of practical materia medica be apprenticeship for not less than two years in compounding and dispensing drugs under a registered medical practitioner, or a member of the Pharmaceutical Society of Great Britain, and as this ordinance would have precluded chemists and druggists, who were not members of the Pharmaceutical Society, from educating such students in materia medica, it prepared a memorial on the subject and transmitted to the Secretary of the Court. The Faculty of Medicine in reply stated it had been recommended that apprenticeship should be restricted to a member of the Pharmaceutical Society of Great Britain, because the fact of such membership afforded a guarantee that an education had been undergone which rendered the members of that Society, in many respects, qualified to give such instruction to their apprentices as a University might be justified in recognizing, whilst the education of registered chemists and druggists was of the most varying description, and the title failed to afford a guarantee of equal value to the title of Member of the Pharmaceutical Society of Great Britain. At the same time, taking into consideration the fact that the alternative qualification of apprenticeship to a pharmacist would affect only a limited number of students, and that the class of students so affected would generally be one whose pecuniary resources were limited, the Faculty of Medicine would be willing to coincide in the suggestion of the Chemists and Druggists' Trade Association and the University Court considered it desirable to adopt it.

Two cases had occurred in which members had been threatened with prosecution by the Board of Inland Revenue for having sold as "finish," methylated spirit, said to contain an insufficient quantity of gum resin, although the sellers maintained that the spirit, when sold, met the requirements of the general order of the Board in that particular. The Executive proposed, at an early date, to take into consideration the advisability of urging the Board to issue an additional order, making it compulsory on the excise officers to leave with the seller of spirit a portion of the finish, etc., purchased, as a protection to him in the event of errors being made by the officials who subsequently deal with the spirit.

The Report then referred to the death, after a protracted illness, of Mr. S. Urwick Jones, the first President of the Association, who occupied the chair three years in succession, and of Mr. T. B. Stead, a member of the Committee. It also stated that Mr. Alfred Wright had been appointed assistant-secretary, *vice* Mr. G. R. Templeman, resigned.

In conclusion, the Report stated that the total number of Members on the Register of the Association at the present time is 3851. The financial statement which is annexed shows that 2743 annual subscriptions and donations to the amount of £63 4*s.* 6*d.* have been received during the current year, being a considerable decrease in the amount of donations from the previous year. From this it will be seen that 1108 members are in arrear with their subscriptions.

The Financial Statement.

The Financial Statement from 15th April, 1881, to 16th April, 1883, was as follows:—

Receipts.

	£ s. d.	£ s. d.
Balance brought forward from last Account, viz.:—		
Balance at Lloyds' Banking Company, Limited, Deposit Account	859 13 2	
Ditto in hands of Treasurer	11 19 4	
	871 12 6	
Deduct Balance due to Bankers on Current Account. 415 19 8		
Law Costs, unpaid 41 15 8		
	457 15 4	
		413 17 2
2743 Subscriptions at 5*s.* each		685 15 0
Donations		63 4 6
		£1162 16 8

Payments.

	£ s. d.	£ s. d.
Advertisements		4 16 0
Auditors' Charges		18 18 0
Bank Interest and Commission charged on Current Account, less Interest allowed on Deposit Account		0 15 5
Canvassing Expenses		5 12 9
Hire of Rooms for Public Meetings		7 15 0
Law Costs, viz.:—		
Solicitor's Charges	51 11 0	
Ditto Travelling Expenses	24 14 8	
Witnesses' Charges and Expenses	41 17 8	
		118 3 4
Office Expenses, viz.:—		
Cleaning	2 3 0	
Gas	2 18 7	
Rates and Taxes	5 3 6	
Rent	26 0 0	
		36 5 1
Postages		94 4 1
Reporting		25 1 6
Salaries, viz.:—		
Secretary	150 0 0	
Assistant Secretary	137 0 0	
Clerk	47 19 0	
		334 19 0
Stationery and Printing		97 18 10
Sundries		15 2 0
Travelling Expenses, viz.:—		
Executive Committee	107 8 3	
Secretary	28 17 0	
Assistant Secretary	7 13 0	
		143 18 3
		903 9 3
Balance carried forward to next Account, viz.:		
Balance at Lloyds' Banking Company, Limited, Deposit Account	479 12 9	
Ditto in hands of Treasurer	18 1 0	
	497 13 9	
Deduct Balance due to Bankers on Current Account	211 16 10	
Law Costs, unpaid	26 9 6	
	238 6 4	259 7 5
		£1,162 16 8

Mr. Urwick (London) moved that the Report be adopted. He said there had been fewer cases than usual of prosecution, but he hoped this would not lead to any lukewarmness on the part of the members.

Mr. Green (Woolwich) seconded the motion.

Mr. Barclay remarked that the Executive were always glad to have their work criticized, but he considered it a very pleasing feature in the Report that the number of cases had been so few in which proceedings had to be taken; it was not because cases had been neglected, but there was much less illegal trading now than when the Society was founded. There were four cases now outstanding, but they had only recently been reported.

Mr. Harrison (Vice-President) regretted to see that the finances were by no means in a satisfactory state; in fact, if they went on for another year in the same way they would come to the end of their tether and have to stop. The question was, what was to be done, and there seemed to be only two courses open, either to advance the rate of subscription or increase the number of members. He had always thought that the amount of subscription should be kept if possible at the old figure, because they wanted moral strength, which could only be obtained by numbers. The only other course seemed to be for every member in his own locality to seek out those who were not yet members and induce them to become so. This might be done by showing them what the Association had done. Seven years ago, when the Association was started there were threatened prosecutions almost every week, either by public analysts or medical societies, and everyone was wondering whose turn would come next. The Association, however, had gone on quietly doing its work, until now there were very few such cases, and no better test could be given of the success of the organization. A great general had said that the best guarantee of peace was to be well prepared for war, and to a certain extent that was no doubt true. If they wished not to be molested either from above or below they must be prepared to show a united and powerful front. He hoped, therefore, that every member would do his utmost to avoid the financial collapse with which they were threatened.

Mr. Parker (Nottingham) suggested that the Secretary should visit the various towns and call meetings with the view of getting new members.

Mr. Jervis (Sheffield) said that had been done and did not prove remarkably successful.

Mr. Green (Woolwich) hoped the subscription would not be raised. Everyone in Woolwich belonging to the trade had joined the Association simply through his calling upon them.

Mr. Williams (Manchester) thought it would be an advantage if the subscription were not fixed at 5*s*. Many could well afford to give more, and at such a time as this they ought to feel it their duty to do so.

Mr. Symes (Liverpool) was opposed to any increase in the subscription. The great difficulty was the lethargy of the trade, as shown by the number who were now in arrears; but if any increase were made in the subscription, many would hail it as an excuse for withdrawing altogether. He did not agree with Mr. Williams's suggestion that the subscription should be indefinite, because there was a donation list open. He was quite sure the advantages of the society were worth more than 5*s*. a year to the smallest tradesman in the country. An idea had occurred to him, which he would mention, though he had not thoroughly matured it. Many who subscribed 5*s*. and gave a guinea as a donation hardly felt that they had a right to the services of the Association if they were attacked; but perhaps an insurance fund might be started, by which a man paying five guineas a year would be entitled to defence by the Society. Some might say that this would be offering a premium to carelessness, but he did not see how it could act in that way, for whatever the pecuniary result there would always be a stigma on a man who had acted carelessly.

Mr. Mackenzie (Edinburgh) did not think the idea just thrown out would be of any assistance in getting them out of their present difficulties. The members were practically insured now, as the Executive took up every *bonâ fide* case; but he did not think this fact was sufficiently utilized in convassing for new members. He thought it would be well to adopt the suggestion of having the subscription 5*s*. and upwards, and let it be thoroughly understood that unless more money were forthcoming either the prosecution or defence of cases would have to be abandoned.

Mr. Cross (Shrewsbury) agreed with the last speaker. He thought the funds had suffered from the collectors having two columns to fill up, one for subscriptions and another for donations. This year, especially, it should be made plain to all their constituents that it was absolutely essential that those who could afford it should give more than the minimum. He thought the members of the Executive in their different districts ought to call the trade together and put before them the financial state of the Association and ask them whether it was to go on doing the work it had been doing, or cease altogether, for it certainly must cease altogether unless it had further support. He felt sure, in his locality, although there were no particularly burning questions to be discussed, it would be sufficient for them to see that there was the probability of a Pharmacy Bill to make chemists immediately feel that now was their opportunity to have such a thing well discussed before it became law. An Act of Parliament was not simply a charter giving more liberty, but was also a fetter on their freedom of action, and it would be a very serious thing if at such a juncture the Association should cease to exist. He had every confidence in the Pharmaceutical Council, but there was an element which

the members of a trade association ought never to lose sight of. It was not to be supposed that the Pharmaceutical Council could have that knowledge of the wants of the trade as a trading community which was necessary to pass such an Act as he had referred to.

Mr. Mason (Liverpool) opposed the idea of having subscriptions of different amounts, and thought they should rely more on the action of the local secretaries. He also doubted whether it was advisable to always hold the annual meeting in London. He would suggest that it might be held at the time of the Pharmaceutical Conference; for instance it might be held at Southport this year. He should also oppose any suggestion to raise the subscriptions.

Mr. Paterson (Aberdeen) thought it was a good suggestion that the Secretary should go from time to time to various centres and hold meetings; he would then hear if there were any local grievances to be redressed and whether the Association could without much expense devote a little time and energy to such particular localities.

Mr. Jervis said he should object to what Mr. Paterson proposed. It had already been tried. He remembered when Mr. Haydon came to Sheffield and the visit was well advertised there were about six chemists came to the meeting, who were all subscribers already. It would require a great deal of money to send the Secretary down to Scotland, and they had not the money to spend.

Mr. Harrison thought it would be better if the Secretary prepared a list of the towns where the Association was numerically weak and communicate with a member of the General Committee in those districts and ask him to call a meeting of the trade with the view of discussing trade matters and increasing the number of members.

Mr. Mackenzie thought it would be more useful to visit gentlemen individually.

Mr. Cross said there were different classes of people; some were most affected by meetings, others by personal interviews, and he suggested they should combine the two.

Mr. Bell (Hull) said he should object to the subscriptions being raised. Five shillings was a fair sum, and if when the Association was started it had been fixed at a higher rate it would not now have been in existence. It had done an immense deal of good, and they should all do the best they could to get in more money. If the resolution were passed, asking the local secretaries to call meetings in the various towns, it might be one means of getting more members and further subscriptions; but if the Secretary were sent it would cause a great deal of expense. When he came to Hull there was a good meeting, but very few new members were made.

Mr. Urwick said he often called on chemists in any town he happened to be in, and generally mentioned the Association, and had found good results from it.

Mr. Barclay said some valuable suggestions had been made, but the most important of these was to go into the country and holding meetings. Although Mr. Jervis had not much faith in that mode, having taken considerable part in the formation of the Association itself, he felt sure that if the thing were taken up by the Executive a great deal of good might be done. Mr. Williams's suggestion was also worth attention; he felt sure from the donation list there would be many who would be willing to subscribe a guinea, but he should be sorry to raise the subscription.

The President, in putting the motion, said they had now arrived at a point when it was absolutely necessary for those interested in the maintenance of the Society to put their shoulders to the wheel, and make sure that the vehicle was not stopped in its progress. He believed that the Society had done immense good, and that it was absolutely desirable that it should continue to exist. There was always a large amount of apathy in the minds of chemists and druggists; but it was not confined to them by any means. The Executive when re-constituted would have to face this matter, and consider the various suggestions which had been made. Perhaps it would be a happy thing if some analyst would give them a tickling up; but irrespective of any outside attack of that sort, the common self-interest of the trade ought to be sufficient to hold them together. He could not make up his mind at the moment as to the propriety of the various proposals, particularly with regard to the amount of subscriptions being optional, instead of a separate donation list. He did not see much difference between the two, but he thought they might appeal with confidence to all those who could afford to give more to support the society better.

The motion was then put and carried unanimously.

Mr. Urwick and Mr. Paterson were appointed scrutineers of the voting list for the members of the Executive Committee to be recommended to the general meeting.

The General Meeting.

The President having taken the chair, the notice was read by the Assistant Secretary.

The report was agreed to be taken as read.

Mr. Harrison (Vice-President) having referred with regret to the absence of the Secretary, and expressed a hope that he would soon recover his wonted health, proposed the adoption of the Report. One very satisfactory feature was that the work the Association had been called upon to do during the year had been exceedingly small, and there could be no better test of the efficiency of the Association than the fact that there was so little work for them to do. The state of things was very different now to what it was seven years ago. The immunity from persecution which they now enjoyed was, he believed, entirely owing to the action of the Association. It would be noticed, too, that in one or two cases which had been brought forward the prompt action of the Society had prevented their going further; it was one thing to attack an individual and another to attack a powerful Association; and he might remark also that the Executive had been very careful never to undertake a defence unless there were good grounds for doing so. One feature in the Report which was not so gratifying and which deserved most careful attention was the financial position. The expenditure was exceeding the income by a considerable sum, and unless they had a larger income during the coming year by that time next year they would probably find themselves without any funds at all. The expenditure was really of so trifling a character that it was not creditable to so large and fairly affluent a body to allow an Association like that to languish for want of funds. It being granted that there was work to do, and that it did the work, the munitions of war ought to be freely forthcoming. He might say, however, that the Executive had always been bold enough to defend a case, whatever the state of the funds might be, and he believed at any time if there were a serious call on their funds the trade would respond liberally to any demand made upon them. At the same time he would urge that it was not good, either for associations or individuals, to be always just on the border line; they liked to have something to stand by, so that in case of emergency it should not be necessary to make a special appeal. He believed it would be a disastrous policy to attempt to increase the rate of subscriptions, and the only other method was to endeavour to increase the number of members, and he hoped every gentleman in the room that day would make up his mind that there should be no chemist in his district not a member who should not be appealed to directly with a view to inducing him to become one. Nothing of very startling importance had occurred during the year; there had been no burning questions, but at the last moment there was a poison question, on which there was difference of opinion. He referred to the proposed amendment of the Pharmacy Act. This had received the attention of the late Executive, and

certain amendments had been proposed, which, it was believed, would make the Bill of some little use to the trade at large. The more he looked at it the more he was convinced that in its present form it would be of very little use indeed. The principle of the Act of 1868 was briefly that no man who had not proved his qualification for the sale of poisons should be allowed to sell them, and certain articles were enumerated, and restrictions put upon their sale. He did not think the principle of that Act had ever been attacked; it had received the sanction of the Legislature and of the public. The Act itself failed to give effect to the principle which it contained, and hence, from time to time, they had been called upon to make amendments and improvements, and the time seemed now fairly to have come for doing so. Instead of amending the Act by giving full effect to the principle which it contained, an entirely new principle was introduced, and with all due deference, the principle enunciated in this amending Act was altogether destructive of the principle of the former one; in fact, it might be called a Pharmacy Act Annihilation Bill. He believed the placing of a variety of strong acids under the name of 'poisonous' substances was a great mistake. Certain bodies were called 'poisons,' and certain others of a much stronger character were only of a 'poisonous' nature. Now an Act of Parliament, whatever else it did, should have some regard to common sense and the ordinary meaning of language, but in the present case he believed the term was grossly misleading, and would lead to innumerable blunders. The proposed Bill contained a clause that any patent medicine containing poison should only be sold by a registered chemist and druggist, and be labelled with the word "poison," the name of the poison contained in it, and the name and address of the seller. This was reasonable and proper, but it also enacted that when it left the hands of the makers it should be properly labelled so that all the seller had to do was to hand it over to the purchaser in the state in which he received it. No great skill was required for this unless the purchaser required some advice as to the taking of it. But with regard to poisonous substances, men more or less illiterate might deal with them who had no knowledge of what these substances were, but would be allowed to sell them indiscriminately provided they labelled them "poisonous," and put their name and address upon them. He considered this a gross injustice. There was much more skill required in the sale of these poisonous substances than in the sale of patent medicines. He did not say, do the one and leave the other, but place them both in the hands of the chemist, and if that were not possible leave the law as it was. If Parliament would not place the sale of these things in qualified hands let Parliament take the responsibility, but he did not think they ought to go to Parliament and say it would be safe for any person to deal in such things. It was one thing to accept a proposal like that if it came from Parliament, and quite a different thing to suggest that such a thing should be done. One other matter referred to in the report was adopting a memorial to the Inland Revenue authorities, with reference to the sale of methylated finish. At present, anyone from the Inland Revenue Office could purchase methylated finish and send it to Somerset House for analysis, and if the chemists there said it did not contain the proper quantity of gum the seller was liable to a fine. A case of this kind came under his notice a short time ago, in which the vendor said distinctly that he had put in the full quantity of resin, but he had no means of knowing that the precise article which he sold had been analysed. It was proposed, therefore, to send a memorial suggesting that the method followed under the Adulteration Act should be adopted here, and that when a purchase was made for the purpose of analysis it should be divided into three portions, and sealed up, one of which should be retained by the vendor, which would be a protection to him He concluded by urging on all members to do their utmost to increase the adherents to the Association.

Mr. Green (Woolwich) seconded the motion. He felt it would be very injudicious to raise the amount of subscription, and he also disagreed with the idea which had been thrown out that morning that there should be a minimum subscription of 5*s*. If that were put forward he believed they would lose one-third of the present members. Many who now gave 5*s*. if they were aware that other members gave 10*s*. or £1 would not be disposed to subscribe so much and would not give at all. The number of members depended on the individual action of the Secretary and the local members.

Mr. Wilkinson (Manchester), referring to the Pharmacy Act Amendment Bill, said it was not generally understood that this Bill was the result of a compromise between the Pharmaceutical Society and the Government. The Society, as they all knew, was very anxious to include every article referred to in the list of scheduled poisons, but the Government refused to hear of anything of the kind. Those articles which were called poisonous were very largely used and sold by persons not in the trade, and it would be quite impossible to restrict their sale to members of the trade. He thought it was a mistake to put them in the Bill at all, and that they should rather have left that clause entirely out, and said to the Privy Council, if you choose to put this clause in as an amendment, we will accept it. With regard to the methylated finish question, any difficulty with regard to it was easily avoided by a chemist taking out a licence, in which case he would be perfectly safe. With regard to patent medicines it seemed simple to say that these patent medicines should be labelled "poison" and sold only by chemists and druggists; but it was not really so. Probably there was not one present who did not make up a cough medicine which did not contain 5 or 6 drops of laudanum in a dose. Was that to be called poison? if not, where could the line be drawn? He had no objection to the sale of patent medicines being restricted to chemists, but he did not care much about it, and they ought to be very careful in legislating, or they might tie their own hands much more than those of other people.

Mr. Symes was much surprised to find the Vice-President condemning the Pharmacy Act Amendment Bill, which would imply that the chemists and druggists were perfectly satisfied with the state of pharmacy now existing. But he could not take that view, because they had been complaining for a great many years that some different regulations were required, and the only advantage they possessed under the present Act was the monopoly of a few poisons, the sale of which they would rather be without. Now an attempt had been made to improve the state of the present law with regard to pharmacy; whether it would be a failure or success he was not prepared to say, but he certainly thought it was wise to make the attempt. The Vice-President seemed to imply that these few poisons that chemists had not thought worth while selling were everything; that it was very sad to have anybody selling poison who was not a chemist and druggist, although it might be used to a large extent commercially, as Mr. Wilkinson had said. It was a well-known fact that the Government wanted a Poison Bill, but they, the chemists, wanted a Pharmacy Bill, and a compromise had been struck between the two. The original Pharmacy Bill of 1868 was really brought forward as a Poison Bill. The beginning of the title was, "An Act for Regulating the Sale of Poisons," and that was a predominant thing in the mind of the Government at the time, and the same was the case now. The Government would only act in a public point of view, and whatever would benefit the public the Government was willing to accede to. They, on the other hand, believed that if they were to educate the people who were to sell poisons, that was better than putting them under restrictions. Under these circumstances, it seemed to him wise to go as far as they had gone. The new Bill would not, in his mind,

destroy in any way the principle involved in the previous Act; it only showed how two persons might look at the same thing from opposite points of view. He could not see how anyone was injured, because these few poisons were left in the hands of those who now sold them.

Mr. Candy thought they all ought to be glad that someone came forward with some attempt to remedy the condition of things, though he was by no means at one with the Pharmaceutical Society in the Bill they had brought forward. It must be borne in mind, however, that the Pharmaceutical Council never professed to act in the interests of the trade, but in the interests of the public, and to a certain extent they were justified in doing so, because, as Mr. Symes said, it was no use going to Parliament with any class interest. To a certain extent he agreed with the Bill if the ninth clause could be passed, but he did not believe that Parliament would ever pass such a clause. He also objected to the educational clause. He did not object to education *per se*, but to people being bound to acquire a certain education, unless subsequently they had some probability of receiving some remuneration for the time, labour and expense they were put to. With regard to these few miserable poisons that had been spoken about, who was it that wanted to sell a lot of oil of vitriol or nitric acid? The profits were slender and the trade was dirty. What they wanted was more of a monopoly in the medicine line, in the dispensing and sale of drugs. Neither did he think that if they passed a law to say that these things should be labelled "poisonous" that they would be. It was not like a small trade. The late Baron Liebig said that the sale of oil of vitrol indicated the civilization of a nation, and that being so, it being used so largely in the manufactures and arts, it was altogether out of their sphere. He did not believe the House of Commons would ever pass the ninth clause, for many of them were members of co-operative stores. With regard to the sale of poisons he thought the responsibility should rest on the proprietor, and not on the vendor. It was all very well to say that a prosecution might not occur, but it was a serious thing to anyone who was prosecuted, especially in small towns where the stigma of it would attach to his name for ever. It was true he had his remedy against the wholesale dealer or the manufacturer, but the subsequent intelligence of his having recovered the penalty from someone else would never reach the public, and they did not want to live in daily fear of prosecution. With regard to methylated finish he thought the remedy was in their own hands, but at the same time what Mr. Harrison had said was perfectly true, that when an analysis was to be made on which a prosecution might be based it was only just that a sample should be left with the vendor. With regard to the question of subscriptions, when any great crisis occurred in the trade, members would come forward with the necessary money; but at present they were sailing in smooth waters, and many members thought more of saving their 5*s*. Besides which, some of them were beginning to think that the Association was very much the double of the Pharmaceutical Society, and that it was no use supporting both, and, therefore, he feared their subscriptions would fall off from year to year, unless something occurred to make them rally round again. He believed there was a sphere for both Societies, and should support both, but at the same time he did not want to see so many of the same faces at both meetings.

Mr. Mackenzie hoped that it would always be kept distinctly before the trade that they were not, and were not likely to become, the double of the Pharmaceutical Society. They had a distinct policy, which was that of trade interests. With regard to this Bill he was prepared to give the Council credit for having done their best, but after all it was only their 'prentice hand, and there was an old adage, "If at first you don't succeed, try again," and he thought it would be for the benefit of the trade if the Bill were withdrawn and they did try their hands again. It seemed to him there was more to condemn it than to justify it. With regard to the prosecutions on the sale of patent medicines it was a great pity there should be such a roundabout process to be gone through by the retailer who was prosecuted in order to set himself right, and he thought the penalty ought to be imposed in the first place on the manufacturer. There was a clause about apprentices which had only been accepted in Scotland on the interpretation of someone who was not responsible for it, and he thought it was very dangerous to accept any such interpretation which was not clearly expressed in the lauguage of the clause. The only consolation he had was that the Bill was so unlikely ever to become law that they need not trouble much about it.

Mr. Long (Notting Hill) said some gentlemen seemed to think that they had only to walk down to Westminster and mention what they wanted to be told, "Oh, yes; it shall be attended to;" but that was a grievous mistake. How far it was advisable to go, what they should ask for, and what they were likely to get, were very different things. How were they likely to succeed in an Act of Parliament when the vital interests of a large body of men were represented by the few gentlemen then present? Mr. Candy objected to seeing the same faces there and at Bloomsbury Square; but he feared that if they lost them at one they would lose them at the other. It was those men who were most alive to their interests professionally and financially who were the backbone of both Societies. He candidly believed that if the Pharmaceutical Society had put its foot down firmly when its rights were being invaded they would be now in a very different position; but they had been so exalted, so honourable, so far above the shop that they never discussed anything but the public advantage. It was no use, however, talking about the Bill; they could only leave it in the hands of the Council, and if they did not believe in the Council they must turn them out and put other men in. As to the advisability of putting the poisonous schedule in, he thought if they stood more on their own rights and were not quite so anxious about the welfare of the public,—not that he wished to injure the public, only he wanted to live,—it would be just as well, and they need not go out of their way to be so extremely careful of the public. He was sorry to hear so many gentlemen had not paid their subscriptions, but he thought the blame must lie at headquarters. He thought if Mr. Haydon would write down to a member of the Committee in places where gentlemen had not paid they would go round and get subscriptions. He had introduced some dozen members, and if he found they did not pay he would endeavour to persuade them to do so, and he could not accept the notion that any of these gentlemen could not find the 5*s*.

Mr. Allen (Kilburn) said there was no doubt a great apathy and want of cohesion in the trade; but this might be partly caused by circumstances, gentlemen being so much confined in their business they were not able to meet together. The meeting was not large, but it was a representative one. He thought it was very important that they should come to some definite conclusion as to what position should be taken up with regard to the Pharmacy Act. He understood that the Executive had to a certain extent endorsed the Bill, but the Vice-President did not agree with the schedule of poisonous articles. It would be a great point to come to some conclusion on this matter, which appeared to him to be the great question of the present time. The poisonous schedule was certainly an innovation, but many believed that this would not detract from their position. He had been accustomed to see large quantities of acid sold whilst living in a mining district, and he should be sorry if pharmacists were mixed up in the sale of these articles. They knew perfectly well that the Privy Council would not accept strong acids as poisons. As far as patent medicines were concerned, if it was thought that the proprietor should be responsible for the label, he should

support the amendment, but the time was really come when they should decide whether to support this Bill or not. If they could support it he would ask those who could not exactly agree with it to forego their individual opinions and do what seemed to be for the best of the whole trade.

The President said there had been some difference of view about the Pharmacy Bill, and it was considered desirable that the Executive Committee should send a deputation to the Pharmaceutical Council with regard to it, so that they might discuss these minor points. He need not say how important it was that the trade should be united.

Mr. Whittle was very sorry to see the subscriptions had fallen off in the way they had. He considered every chemist in business ought to feel himself bound to support an association of this kind, because everybody must feel that it had not spent money extravagantly and had done good service to the trade at large. Who could say how many prosecutions there might have been if the Association had not existed? He remembered when there was a two guineas licence for the sale of patent medicines, and some gentlemen complained then that they did not sell two guineas' worth in a year, and after a great deal of agitation they got the licence reduced to 5*s*., and now they found barbers, drapers and stationers all selling patent medicines; and judging by what appeared in the journals, it would seem as if the whole of their trade consisted in patent medicines. What they really wanted was dispensing, and he believed if they could only let the public know how some of it was done, instead of going to the doctor's they would go to the chemist. They did not want to sell strong acids, but at the same time he did not think it was for them to go to Government and propose to move in the matter. Though the Bill was not all he could wish, he thought it was calculated to do some good, and he hoped it would be supported unanimously. The last Bill would have been a much better Bill than it was if it had been backed up by the whole trade.

Mr. Barclay said this was a very important crisis in the history of the trade, and he could not insist too strongly on the sentiment just expressed that it was of the utmost importance to present a united front. Some one had said that the same faces might be seen there and at Bloomsbury Square, and he took it that was the right thing, that the men who felt the responsibility of guiding the trade, or the profession, should exercise the two functions, one of looking after the public and the other of looking after the trade. It was not the business of the Pharmaceutical Society so much to look after the trade side as the professional side, and therefore this Association had sprung into existence and had taken root. Mr. Richard Reynolds at the outset spoke of the Trade Association and the Pharmaceutical Society as being like the old country weathercocks, where the man came out in the stormy weather and the old lady came out in fine weather. He would not say which was to be the old lady, but he thought they ought to work together, and he hoped one of the results of the meeting would be an instruction to the Executive to ask for an interview with the Council of the Pharmaceutical Society so that their differences might be arranged. Differences did exist and it was very well they should. As a trade Association they went further than perhaps the Pharmaceutical Society could see their way to ask from the Government. For instance, he was surprised to find that the jury question had not cropped up, for he expected some inquiry would be made why it was that this Bill did not contain a clause exempting chemists from jury service.

Mr. Allen said the making of all in the trade pharmaceutical chemists in future would eventually exempt everyone from jury service.

The President said this matter was not considered proper for insertion in the Pharmacy Bill at all, and there was a fear that if it was brought forward even pharmaceutical chemists might lose the exemption they now enjoyed.

Mr. Barclay said all this showed the desirability of a conference between the two bodies. Every one must admit there were germs of good in the Bill, and he was very thankful to the Council for having done what they had in the matter. With regard to the question about methylated finish, he was sorry to say there were many who were unable to pay the 10*s*. 6*d*. licence; who did not sell 10*s*. worth of finish in the year. A case had just occurred which led to the introduction of that clause in the report. A chemist was called upon for some finish which he made himself and asserted positively that the proper amount of gum was there, but six weeks afterwards he was called upon and told that the stuff had gone to the Inland Revenue Department, had been analysed, and that there was not the proper quantity of gum in the preparation, and he expected to be summoned. If he had had a sealed sample left behind he would have had his remedy. He could have come to the Trade Association, have had it examined, and if he were right he would have been protected. Another case had occurred in Wales, where a gentleman was asked for spirit of wine and supplied camphorated spirit of wine, telling the purchaser he was not allowed to sell it pure. But he had heard that he was going to be summoned likewise; and the stuff having gone from his hands, he was not in a proper position to defend himself.

Mr. Paterson said if the Bill were to be gone into in detail, the question of education ought to be discussed, and he believed they would have to go much further in that direction before long. Education ought to be brought home to the doors of the young men who were apprenticed to the business, and it was quite possible that arrangements might be made with the Science and Art Department for providing pharmaceutical education in great centres, so that examinations might take place there.

Mr. Harrison, in reply, said in many cases it was a hardship to a chemist to have to pay 10*s*. for a licence to sell spirit, and if he did, he was restricted to selling 1 gallon per day to any one customer; and the same difficulty might arise with regard to that. The real question was, whether a man was to be left at the mercy of any unprincipled person who might buy the spirit. Some little misapprehension had arisen with regard to what he said about the sale of poisonous substances. He did not argue that they should apply to Parliament to restrict the sale of these matters to chemists, but that they should not go to Parliament to ask them to regulate the sale by other people; but if they dealt with them at all, it should be only in one way—in a spirit of loyalty to the former Pharmacy Act. His contention was that they ought not to teach the Government that it was safe for uneducated people to deal with these strong substances. It had been contended that the Government had refused to legislate in the direction he advocated, but all the evidence was that some time ago the Pharmaceutical Society applied to the Privy Council that certain articles should be added to the schedule of poisons, and the reply was that nux vomica should be added, but all the other articles should be left over until a more convenient season, when they might legislate on the whole matter. This convenient season appeared now to have arisen, but it seemed to be taken for granted that the refusal of the Government to do what was asked at one time was a refusal to do it at any time. As the Government accepted the principle of the Act of 1868, he thought it was their duty to keep to that principle and endeavour to strengthen the working of it. With regard to jury service, he had advocated it so many years that he feared it would be only trespassing on the patience of the meeting if he had brought it forward again, but he was as strongly convinced as ever of the justness of the claim. He hoped the different opinions which had been expressed would conduce to levelling

down some of the inequalities, and that as a result they might be more unanimous in what they intended to apply for.

The President, before putting the motion, said he had always maintained the view that a seat on the Council did not disqualify him from taking part in any matters with reference to the trade; he still maintained that position, and he hoped he should find his judgment had been correct. With regard to the Pharmacy Bill, he had a somewhat difficult position to fill, inasmuch as on the Pharmaceutical Council he had taken the responsibility of moving its acceptance. He had served for many months on committees which had gone into details of the measure, and had endeavoured to weigh as carefully as possible the divergent views, some of which had been very well presented that day; but looking all round and looking at the intrinsic merits of the Bill, he considered it was an excellent Bill. With regard to the much vexed question of the poisonous schedule, the position was simply this. The Government contemplated bringing in a general measure with reference to poisons, and the question was, were they prepared to have such a measure brought in and pharmaceutical legislation ignored. The Pharmaceutical Council thought it extremely desirable that any interference with the sale of poisons should be included in the Bill, although the method proposed in the Bill was not exactly the method they liked; but the danger was this, such was the feeling of the public mind, that there was a tendency on the part of the Government to legislate with regard to poisons quite apart from all consideration of chemists, and he believed that in accepting the 'poisonous' schedule they had done the right thing, although it might wound the sentimental susceptibilities of some gentlemen. Even in countries where pharmaceutical legislation was much more stringent than in England, even under despotic governments, it was found impossible to restrict the sale of these things to chemists, and he maintained that it was good policy to have included this scheme; but apart from his individual opinion on the matter, their only chance of getting legislation at all was being thoroughly united. If they assumed the attitude of some gentlemen who talked about destroying the Bill because it did not meet their views, they would never have a Bill at all. In legislation of any kind you could never get all you desired; you must move by stages, and if the Bill included a considerable amount of good, the wise policy was to accept it. At the same time, he thought it very desirable that the Executive should have a conference with the Pharmaceutical Council, and if possible come to an amicable and substantial agreement.

The motion for the adoption of the Report was then put and carried unanimously.

The President then moved that the following names, recommended by the General Committee, be accepted as the Executive Committee for the ensuing year:—

Andrews, Frederick, London.	Holdsworth, T. W., Birmingham.
Arblaster, C. J., Birmingham.	ervis, W., Sheffield.
Barclay, Thomas, Birmingham.	Jones, O., Llanwrst.
Barnaby, Henry, Rochester.	Maltby, J., Lincoln.
Bell, C. B., Hull.	Mason, A. H., Liverpool.
Chapman, Henry, Scarborough.	Parker, W. H., Nottingham.
Churchill, W. J., Birmingham.	Southall, William, Birmingham.
Cross, W. G., Shrewsbury.	Symes, Charles, Liverpool.
Ellinor, G., Sheffield.	Walker, G., Coventry.
Hampson, Robert, London.	Williams, F. P., Manchester.
Harrison, John, Sunderland.	Yewdall, E., Leeds.

For Scotland:—Messrs. G. H. Laird, Edinburgh; James Mackenzie, Edinburgh, and James Paterson, Aberdeen.

Messrs. Urwick and Paterson were then appointed scrutineers of the ballot papers for the election of officers.

Mr. Bell moved—

"That it is most desirable that chemists and druggists generally should be united in support of the Pharmacy Bill, it being an instruction to the incoming Executive to arrange an interview with the Pharmaceutical Council to promote that object."

Mr. Williams (Manchester) seconded the resolution, which was carried unanimously.

Mr. Mackenzie then moved—

"That a memorial be presented to the House of Commons in support of the claims of pharmacists to be associated with members of the medical profession in a legally constituted committee for the purpose of preparing the British Pharmacopœia, and that the Executive Committee be requested to take the requisite steps to obtain an amendment in the Medical Bill now before Parliament in furtherance of their claims."

He believed that such a resolution would commend itself to every member of the trade; it was a question of justice and fair play, and he thought it would commend itself also to the common sense of Parliament.

Mr. Allen seconded the motion.

Mr. Holdsworth asked what stage the Bill was in.

The President said the Bill was down for second reading on Thursday. It was the intention of the Pharmaceutical Society to ask some Member of Parliament to move an amendment in the direction of this resolution.

Mr. Holdsworth suggested that a memorial should be sent from that meeting in order to save time.

Mr. Long said there could not be much doubt about the advisability of taking some action in the matter. The Medical Council had proved their incompetency to prepare the book called the Pharmacopœia, and had made such a hash of it that they were obliged to call in experts to assist them. When there was an attack made by the apothecaries on chemists, he communicated with both Members of Parliament for his borough, and one wrote saying he should oppose it, and the other wrote asking for information.

Mr. Mackenzie said this resolution would not prevent the right of any individual member to speak to his own representative on the subject.

Mr. Andrews said this subject was of very great importance, and he had no doubt many gentlemen would take the opportunity of speaking to their members upon it. They might be told that they had already got what they wanted, because their three Professors had been appointed to aid the Medical Council, but his answer was, those gentlemen were not appointed by the Pharmaceutical Society, they were simply paid servants of the Medical Council. They did not wish in any way to share in the profits of the Pharmacopœia, but simply to be recognised as proper persons in conjunction with medical men to frame this book, and in so doing they only asked what was accorded to pharmacists in every other civilized country.

The scrutineers here returned, and it was announced that Mr. Harrison (Sunderland) was elected President, Mr. Cross (Shrewsbury), Vice-President, Mr. Southall, Treasurer, and Mr. Churchill, Hon. Secretary.

Mr. Harrison accordingly took his seat as President. He thanked the meeting for the honour done him. He regretted very deeply that his old friend, Mr. Hampson, had thought proper to retire, for to him it was a matter of great satisfaction to have been his lieutenant, and he should like to have continued in that capacity for another year. Mr. Hampson, however, had thought otherwise, and no doubt for sufficient reasons. He felt very unworthy to follow in the footsteps of his distinguished predecessor, but he would do his best that the work of the Society should not suffer.

Mr. Cross also thanked the meeting for the honour done him, which was to him one of the greatest surprises he ever met with in his life.

The President then proposed a vote of thanks to Mr. Hampson for the very able manner in which he had discharged the duties of his office. This was seconded by Mr. Long, and supported by Mr. Barclay, and carried by acclamation.

Mr. Hampson said he was extremely obliged to the

meeting for this kind expression. He should still remain on the Executive and do his best in that position.

The President then read Mr. Mackenzie's motion, altered to meet the views expressed, as follows—

"That a memorial signed by the officers of the Association be presented to the House of Commons in support of the claim of pharmacists to be associated with the members of the medical profession in a legally constituted Committee for the purpose of framing the British Pharmacopœia, and that the Executive be instructed to take such steps as they think desirable to carry out this resolution."

The motion was carried unanimously.

Mr. Jervis said no one present was more glad to see Mr. Harrison in the chair then he was, but he thought the mode of electing the officers was very unsatisfactory, and it would be much better if the President were proposed and seconded.

The President said the rules provided that the officers should be elected by ballot, but not that there should be any nomination. If Mr. Jervis thought it was unsatisfactory, he must give ten days' notice next year of his intention to propose an alteration in the rules.

Mr. Wilson (Grimsby) said the question of prescribing by chemists was so important that he thought some attempt should be made to obtain a definition as to what was illegal, and he hoped the Executive would take the matter into consideration. He begged to move—

"That the Executive be requested to take speedy steps in this matter."

The motion was not seconded.

Mr. Paterson thought, with regard to the previous resolution, it would be well if some steps were taken to let members of Parliament know that there was a movement in the matter.

Mr. Hampson said the Pharmaceutical Society would shortly present petitions, and it would be desirable the Association should do so at the same time.

Mr. Urwick suggested that each town should petition its own member, and if they could get every chemist in the town to write independently it would do more good than 10,000 printed papers.

Mr. Mason suggested that the Secretary should send to each Local Secretary suggesting pressure being brought to bear upon Parliament.

Mr. Long then moved a vote of thanks to Mr. Hampson and Mr. Harrison for their conduct in the chair, which was seconded by Mr. Barclay and carried unanimously.

Provincial Transactions.

BRIGHTON ASSOCIATION OF PHARMACY.

A meeting of the Association was held in the Town Hall on Wednesday evening, May 16, being called to consider the resolution which Mr. Sandford purposed moving at the Annual Meeting of the Pharmaceutical Society.

Mr. W. D. Savage, occupied the chair.

Mr. Vizer introduced the subject, strongly condemning clauses 4 and 5 of the proposed Bill to alter and amend the Pharmacy Act, and moved the following resolution: "That in the opinion of this meeting clauses 4 and 5 of the proposed Bill to amend the Pharmacy Act, 1852, by which proprietary medicines containing a poison within the meaning of the Pharmacy Act, 1868, will be required to be labelled 'poison,' and in default thereof that the retail vendor of such proprietary medicine shall be liable to prosecution, will act most injuriously to the interests of such proprietors and throw the responsibility upon retail vendors for an offence over which they have no personal control. This meeting therefore appeals to the Council to erase the said clauses from the proposed Bill."

The motion was seconded by Mr. H. Barton.

After some discussion, in which Messrs. Savage, Cox, Higham, Vizer, Barton and Leigh took part,

Mr. Marshall Leigh moved the following amendment, which was seconded by Mr. Gwatkin:—"That this meeting is of opinion that the original makers or their agents should alone be subject to a penalty for not labelling a patent medicine according to clause 4 of the Bill to amend the Pharmacy Act, 1852."

On being put to the meeting, four voted for the amendment and two for the original motion.

The amendment was therefore declared carried.

A vote of thanks to the Chairman brought the meeting to a close.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

A meeting of this Society was held on Thursday, May 17, Dr. W. H. Perkin, President, in the chair.

The following certificates were read for the first time:—

T. H. Coleman, B. Hobbs, B. P. Lascelles, M. F. Purcell, W. R. Reffell, D. Wilson.

It was announced that a ballot for the election of Fellows would be held at the next meeting of the Society, on June 7.

The President then called on Captain W. de W. Abney, F.R.S., to deliver a lecture—

On Photographic Action Studied Spectroscopically.—The lecturer said that he wished all chemists to become photographers, for photography occupied the borderland between chemistry and physics. The days had been long past when black fingers were a necessary concomitant of photography. At the present time there was a vast number of amateur photographers, but there were only a few who studied the scientific aspect of photography; by most experimenters it was looked upon as a servant to be abused rather than used, and the majority were content with working by rule of thumb. The lecturer was firmly impressed with the fact that photographic action is interatomic. He had already shown in a previous paper that throughout the absorption spectra of a series of organic compounds, the absorption due to hydrogen could be recognized; something of the same kind seemed to occur in inorganic chemistry. Probably the first photographic action with which most chemists become acquainted is the blackening of chloride of silver by light. Now if this salt be perfectly dry and perfectly free from organic matter, etc., it will not blacken when exposed to light. Two tubes were exhibited, both of which had been exposed for some time to the action of light; in one the chloride was quite white, inthe second the chloride, which was moist, had blackened. The action of developers was then discussed. A picture on iodide of silver paper, which had been previously exposed, was developed before the meeting with gallic acid and solution of silver nitrate. The action of the light is to liberate free iodine, and the developer precipitates metallic silver to form the image. The number of particles acted on by the light must be extremely small. The image can be washed off with nitric acid and a fresh picture taken on the same film. A second image was developed with citrate and oxalate of iron; in this case the metallic silver must have been obtained from the film itself. Some other experiments were shown proving the truth of this statement. Development is not a chemical but a physical action. It was found on photographing the solar spectrum that the amounts of energy in different parts were very varied and irregularly distributed. Recourse was had to the positive pole of the electric arc light; the incandescent light has not sufficient energy, but the positive pole furnishes a spectrum which has sufficient energy and is much more uniform than the solar spectrum. For pro-

ducing the spectrum, everyone would probably first choose the diffraction grating; but it was found that a perfect grating did not exist, and one grating differed so much from another, owing to minute differences in the ruling, that eventually a glass prism was adopted, as the grating could not be relied on for quantitative work. Films of chloride, bromide and iodide of silver were successively interposed in the beam of the electric lamp, and it was shown that the chloride partially cut off the violet end of the spectrum, the iodide absorbed the whole of the violet, but the bromide cut off part of the blue as well as the violet. An image of the spectrum was then shown on films containing respectively silver chloride, bromide and iodide, and the plates were developed with ferrous oxalate; it was seen that with the chloride but a small portion of the spectrum had acted on the silver salt, and that with the bromide a very much longer image was obtained. The action of sensitizers was next considered; the part played by a sensitizer is the taking up of the chlorine, bromine and iodine set free by the action of light. To demonstrate this action, an image was thrown on to a sensitive plate, and during the exposure, a streak was made across the plate with a solution of sodium sulphite; on developing, a black stripe indicated the position of the sodium sulphite, this salt having rendered the silver salt in its vicinity more sensitive. A sensitizer is useless unless it be close to the salt on which it is to act; so all sensitizers are more or less hygroscopic, or they may act in solution or as vapour. Almost any organic compound acts as a sensitizer. The lecturer then gave instances of coloured sensitizers, and photographs of the spectrum were taken on films coloured with cyanin blue and with eosin, the plates were developed, and the relation between the portion of the spectrum photographed and the portion absorbed by these pigments demonstrated. Thus cyanin blue absorbs the yellow, and the photograph of the spectrum on the film, coloured with cyanin blue, exhibits a band in the yellow where the absorption had been previously seen. It is very remarkable that one salt of silver may act as a sensitizer to another salt of silver. Thus a film, containing bromiodide of silver, photographs much more of the spectrum than two films containing the one bromide and the other iodide. It is easy to destroy the results of photographic action. If a film during exposure be washed with any oxidizing agent, as potassium permanganate or bichromate, dilute nitric acid, peroxide of hydrogen, etc., the image is completely effaced. Thus if plates which are foggy from accidental exposure be dipped in dilute bichromate of potash and well washed, they are restored to their original condition. This bleaching effect was demonstrated by throwing a picture on a sensitive plate and during exposure making a streak with bichromate solution across the plate. On developing this streak was seen to be white. A sensitive plate after exposure to light was soaked in dilute nitric acid containing 1 drop of acid in 8 ounces of water, and then exposed to the spectrum. The tendency of the nitric acid was to oxidize; at the violet end, where the reducing power of the light was at its maximum, this tendency was overcome, but the red end was perfectly white. A method of obtaining a reverse image was demonstrated. A sheet of iodized paper was exposed to light, then immersed in potassium bromide solution, a picture was then thrown on it, on developing it was found to be reversed. An instructive experiment was also shown of an easy means of preventing the bad results of over exposure. An extremely sensitive dry plate was soaked in sodium sulphite solution and exposed for sixty seconds to a bright spectrum. On developing a good picture came out not in the least reversed. So a picture cannot be reversed if some substance is present in the film having a great affinity for oxygen. A beam of light was transmitted through films of the three varieties of silver bromide; the ordinary variety was orange, the film used in the gelatin dry plates a sort of French grey; the film used for photographing the ultra red portion of the spectrum, green In conclusion, the lecturer said he had endeavoured to point out to the chemists present some of the pitfalls which beset the practice of photography.

The President, in proposing a hearty vote of thanks to Captain Abney, said that all must feel that they had had a great scientific treat; most chemists had dabbled in photography and must have felt how many points required investigation. He hoped that Captain Abney would continue his researches, and he was sure that no one was more able to carry them out to a successful issue.

The vote of thanks was passed by the crowded meeting with acclamation, and the Society adjourned to June 7, when a ballot for the election of Fellows will be held and the following paper read:—"Laboratory Notes, by Dr. Gladstone and Mr. Tribe.—1. On the Action of Light and Heat on Cane and Invert Sugar; 2. On Hydroxylamin; 3. Recovery of Iodine from Organic Iodide Residues; 4. A Residual Phenomenon of the Electrolysis of Oil of Vitriol; 5. On an Alleged Test for Alcohol; 6. Reaction of the Copper Zinc Couple on Nitric Oxide; 7. On the Reducing Action of Spongy Lead."

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

The Professors and the Pharmacopœia.

Sir,—Mr. Frederick Smith, in his letter in last week's Journal, makes the statement that certain members of Council "would not have said what they did, had Mr. Greenish, in reading what he termed the words of the Report of the Pharmacopœia Committee, read the whole of the words there in which the Medical Council state that they will themselves communicate with the Pharmaceutical Council." Had he himself quoted the precise words to which he alludes this communication would have been rendered unnecessary.

I will, however, give the paragraph in its entirety.

"The Committee, in conclusion, beg to state that it is their intention to apply to the several medical authorities, to the Pharmaceutical and Chemical Societies, and to such persons as may be likely to furnish useful information, with a view of making the work as complete and perfect as possible."

I fail to see that the whole of the words now quoted alters the aspect of the case, but Mr. Smith is entitled to any comfort that he may be able to derive from the publication.

20, *New St., Dorset Sq., Marylebone Rd.* Thomas Greenish.

"Distance lends Enchantment to the View."

Sir,—To save time of the annual meeting I omitted two things fully on my mind, in reference to Mr. Giles's remarks What was the standing of the "dead lions" of twenty-five years ago in the eyes of their contemporaries? Was it a higher one than that now occupied in the eyes of their contemporaries by such men as Messrs. Carteighe, Schacht, Williams, Bottle, Greenish, Squire, Robbins, etc., etc.

I also quite intended to say, that to show my estimate of the *personnel* of the existing Council, and that notwithstanding the difference between their views and my own on so many questions of interest to pharmacists, I have recorded my votes for the entire number (14) of retiring councillors, and I trust, most sincerely, that they will all continue on the Council for the coming year.

Daniel Frazer.

Communications, Letters, etc., have been received from Messrs. Bate, Maben, Landerer, Druce, Watt, Wrighton, Smith, Sinapis, John, Sterlini Oppidum, Cymro, Chrysosplenum, J. H.

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"New York Medical Journal," *August* 1880,
Dr. F. Weir,
in Lecture delivered to the College of Physicians and Surgeons, New York.

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11	FIRST ,, ...Small	200	4 8 0	2 5 0	.....
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13	CUPS, FIRST QUALITY ...Bath Sizes	40	17 16 6	8 19 0	.....
14	,, SECOND ,, ... ,, ,, ...	40	13 14 6	6 18 0	.....
15	,, FIRST ,, ...Toilet ,, ...	100	31 12 0	15 16 6	7 19 0
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17	,, SECOND ,, ... ,, ,, ...	100	18 10 0	9 6 0	4 14 0
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19	,, FIRST QUALITY ...Nursery Sizes ...	200	13 18 0	7 0 0	3 10 6
20	,, SECOND ,, ... ,, ,, ...	200	8 15 6	4 8 0	2 4 6
21	SOLID, FIRST ,, ...Toilet ,, ...	200	18 10 0	9 6 0	4 14 0
22	,, SECOND ,, ... ,, ,, ...	200	12 5 0	6 3 0	3 2 0
23	,, FIRST ,, ...Nursery ,, ...	200	10 12 0	5 7 0	2 14 0
24	,, SECOND ,, ... ,, ,, ...	200	5 5 6	2 13 0	1 7 0
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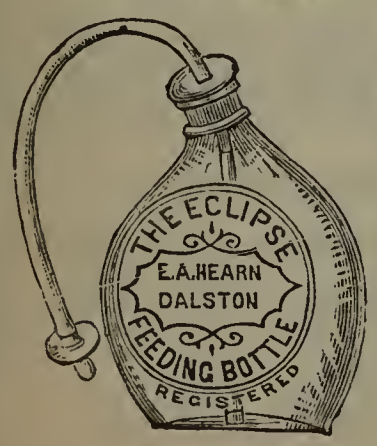

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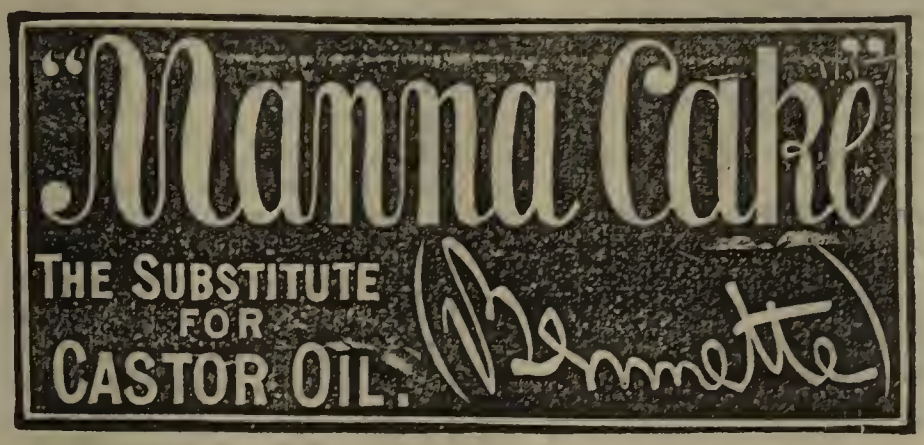

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(through whom alone Chemists can order), who must engage in writing to supply none but Chemists, and to charge cutting Chemists a price at which they cannot cut.

The MANNA CAKE is done up only in quarter-gross cases, for home trade; foreign, in bulk. With each case (the smallest quantity supplied to Chemists) is enclosed a most effective Window Slip (20 in. by 8 in.).

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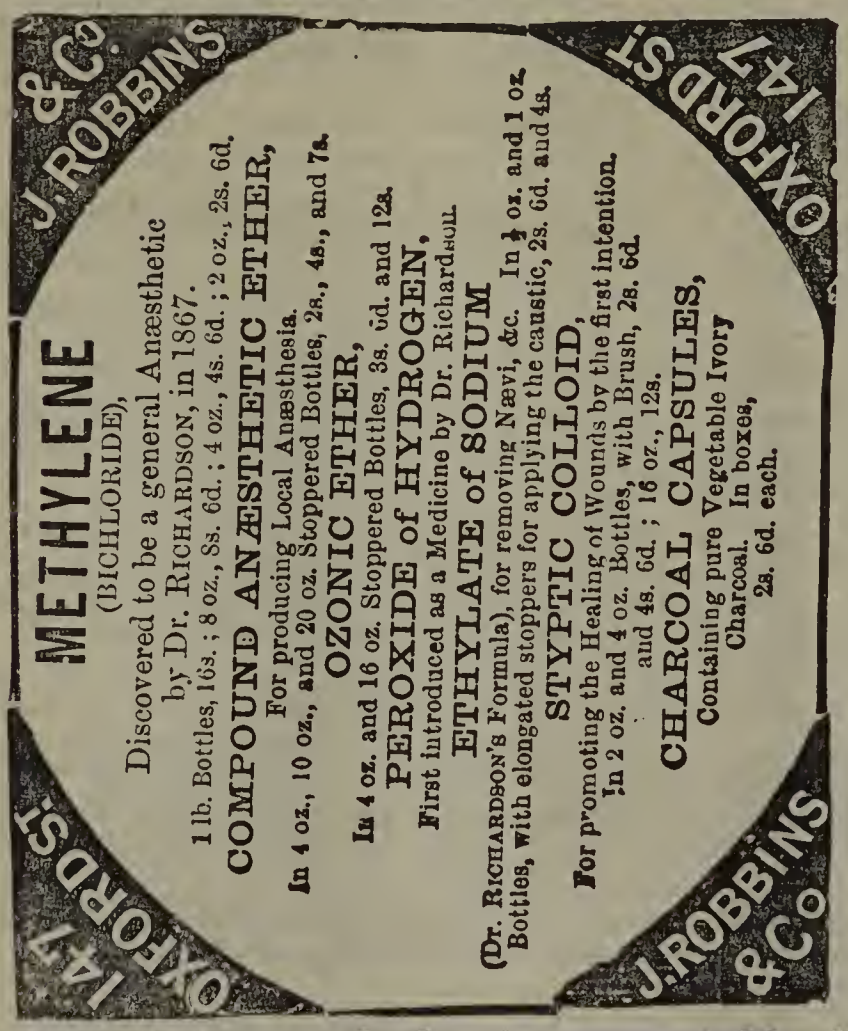

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We strongly recommend our Aperient Pills at 6s. and Compound Rhubarb at 7s. per pound, coated, as saleable Pills. These, or any Pills in our list, are sent out to every part of the United Kingdom in half-pound parcels, package, postage, and carriage free, on the same day as the order is received; and, to avoid booking and other expenses, 1d. in the Shilling will be allowed if stamps or P.O.O. are remitted with order.

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Goods for Export are specially prepared, and are guaranteed to keep in any climate.

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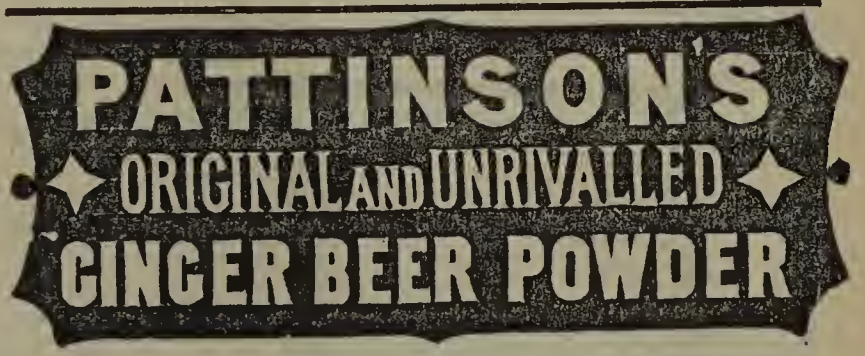

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For administering Tinctures of all dilutions without the inconvenience of dropping, or the necessity of water. Directions enclosed, in any language.

Introduce these wafers and confer a boon on thousands who prefer tinctures but for the inconvenience of dropping. Chemists in India and the Colonies should order a gross parcel in next consignment, which may be had from any Wholesale House, or direct from the Sole Proprietors and Manufacturers, CONYNGHAM & Co., 11, Upper Baggot Street, Dublin.

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Sold in Pots at 6d. and 1s. each

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REDUCED PRICES THAT ALL MAY OBTAIN THEM.
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INDIAN MEDICAL SERVICE.

India Office, 19th May, 1883.

NOTICE is hereby given, that an Examination of Candidates for five appointments as Surgeon in Her Majesty's Indian Medical Service will be held in London on the 13th August, 1883, and following days.

Copies of the Regulations for the Examination, together with information regarding the Pay and Retiring Allowances, &c., of Indian Medical Officers, may be obtained on application at the Military Department, India Office, London, S.W.

The necessary certificates must be submitted to the Military Secretary so as to reach his address at least a fortnight before the date fixed for the examination.

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Special, Rapid and Successful Preparation for Medical and Pharmaceutical Preliminary Examinations.

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3.—That all letters respecting the insertion of Advertisements should be endorsed on the envelopes "**PHARM JOURN,**" and must be sent only to the Publishers.

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PRELIMINARY.—Arithmetic and Metric System, 1s. How to Write an Essay, 6d. Latin Grammar and Cæsar Simplified, 1s. MINOR.—Equations Simplified, 1s. Illegible Autograph Prescriptions, 1s. Minor Questions, 1s. Notes on Dispensing, 1s. Prescriptions given at the Minor, 1s. For "How to Prepare for either Exam.," enclose stamped envelope, CHEMIST, care of Mr. J. Edwards, Wye, Kent. Herbarium of Plants, 6s.

PHARMACEUTICAL PRELIMINARY,

LONDON Matriculation, College of Preceptors, Apothecaries' Hall, Glasgow, Edinburgh, and all Medical Preliminaries. Rapid and thorough preparation, privately and in class. Also postal tuition for these examinations and Bell Scholarship. For particulars enclose stamp, Mr. DAWES, 1st B.A. (Lond.), 11 Burton Crescent, London, W.C.

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The above are manufactured under the supervision of Professor LISTER, by

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Ladywell, London, S.E.

THE

CENTRAL SCHOOL OF CHEMISTRY & PHARMACY

Laboratory and School Buildings:

173, MARYLEBONE ROAD, N.W.

The next Session of this School will commence on Monday, September 3, 1883, and the Principals will be glad to have an early intimation from Students who intend joining at that date. The lectures given at this School are delivered in as practical a manner as possible, and specimens are provided for the Students at the Practical Botanical Classes free of cost.

CONCILIO ET LABORE.

THE

MANCHESTER COLLEGE OF PHARMACY

225, OXFORD STREET, MANCHESTER.

Mr. W. S. TURNER, Pharm. Chemist, M.P.S.

It is proposed to begin the next Session early in August. It will include:—

I. The usual Day Classes and Lectures for October and December Minor Exams.
II. Evening Classes for December Minor.
III. An Afternoon Class (meeting twice a week) for December Minor.
IV. An Afternoon Class (meeting thrice a week) for January Preliminary.

Full particulars, time table, and fees of these Classes, all of which are conducted by Mr. TURNER himself, will be sent on application.

Mr. TURNER is glad to say that in spite of the large proportion of Students (60 per cent.) who fail, he has never passed less than 50 per cent. since January, and last month he passed 80 per cent. of his men.

PRIVATE TUTOR

Mr. JAS. W. SAUNDERS

(*From the Royal School of Mines*),

130, CAMDEN ROAD, N.W.

SIX of my Students presented themselves at the April Minor, **FOUR** passed—all at their first attempt. Those wishing to attend my "practical demonstrations" for the June or July Minor are requested to apply, as my few vacancies are fast filling. **PERSONAL TEACHING. NO DEMONSTRATORS.** Postal Instruction. Enclose stamp for particulars; or "at home" daily from 1.30 to 2.30.

Laboratory close to Gower Street Station.

THE

WESTMINSTER COLLEGE

OF

Chemistry & Pharmacy.

The next Session will commence on Monday, September 3rd.

Students desiring to enter the School at the commencement of the Twelfth Session, on 3rd September, should send in their names without delay, as the few remaining benches in the Laboratory are being rapidly filled up. The regular course is three months, but those already possessing knowledge may enter at any time when there is room.

FEES.

MAJOR OR MINOR.

October Examination	...	...	**£5 5s.**
December ,, ...	...	...	**£8 8s.**
Six Months' Course	...	...	**£10 10s.**

At the Pharmaceutical Examinations held last month, the following students of this College were successful:—

MAJOR.

PIDGEON, J. D. | SPENCER, G.
* SMITH, W. T.

MINOR.

* BADCOCK, H. D.
BANBURY, R.
BARLOW, G.
CARTER, W.
CORDER, W. S.
CURNOW, W. A.
* CUNNINGHAM, O. W.
CODLING, A. J.
* DULLEY, D.
* DUNBAR, G.
* EDWARDS, R. W.
ELSTOB, JNO.
* GEORGE, I.
HEPPLE, T.
HILL, J.
HORNE, C.
* JEANS, A.
* KING, A.
* MIDGLEY, W.
MAY, S. A.
MALLETT, J. T.
* PEARSON, W. J.
* RAWLINGS, W. J.
* ROBERTS, A. H.
* TROAKE, C. F.
* WALKER, G. J.
WOOD, E. J.

PRELIMINARY.

ANDREWS, E. A. | LETHEREN, E. J.
* WOOD, A.

APOTHECARIES' HALL.

* WILSON, D. W. R.
* CUNNINGHAM, O. W.
* BADCOCK, H. D.
* CROFTS, J. E.
* OWEN, D. J.
BECK, P. C.
* KING, A.
* HALTON, J. H.
WILSON, H.

*. These Gentlemen were resident students.

A short Course of Lectures and Classes for the July Examination will commence on MONDAY, June 11th. It will embrace all the subjects, and will be conducted in a practical and thorough manner. To students who have previously failed, or who are already tolerably advanced in their work, this Course will afford unusual advantages.

FEE £2 2s.

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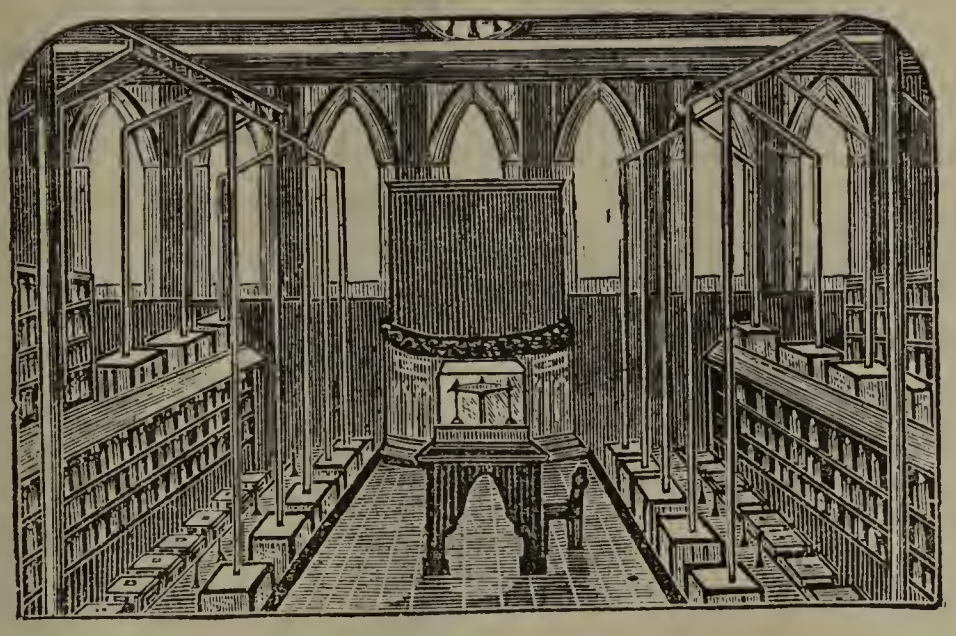

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AND
Private Laboratories
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Special Instruction,
325, KENNINGTON RD.
S.E.

Chemical & Microscopical Analyses for the Trade.

FOURTEENTH SESSION—1882-83.

The Laboratory of this Institution (represented above) is justly acknowledged to be the most elegantly fitted in Great Britain. The nature of the instruction given is proved by upwards of 1,500 living witnesses to its success now on the roll of registered Chemists, as well as by the positions occupied by its non-pharmaceutical students both as Medical Officers of Health and Analysts. The Directors continue to spare no expense in giving the greatest facilities, so as to ensure to students both present success and permanent benefit in after life. All expensive apparatus provided by the School, and students may enter at any time provided there be a vacancy. The Session extends from September 15 to July 20, but students are not bound to take a longer course than they find necessary.

For further particulars apply (enclosing stamp) to W. BAXTER, Secretary.

THE "SOUTH LONDON" SERIES OF PHARMACEUTICAL TEXT-BOOKS.
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Students who desire to commence to read up for their Examinations, but who are unable at present to leave their business engagements, are advised at once to enter under

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Syllabus, opinions of the press, and testimonials sent on application to Messrs. WILLS & WOOTTON, Trinity Square, London, S.E.

FOR TERMS FOR ADVERTISEMENTS, SEE PAGE XXXV.

ENGAGEMENTS WANTED.

AS LEDGER or INVOICE CLERK. In Wholesale. Good references. Moderate salary. C. H., 54, Dynevor Rd., Stoke Newington, N.

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AS ASSISTANT. Accustomed to good class Dispensing and light Retail. Age 21. First-class references. E. C. SPURGE, Church St., Coggeshall, Essex.

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PARTIAL employment required by an ASSISTANT with good West-end and provincial experience. BETA, 3, Hanover St., W.

AS ASSISTANT, or MANAGER of Branch. Experienced. Aged 40. Registered Dentist. Good references. W. V., 12, Romney Pl., Maidstone.

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LOCUM TENENS. Minor qualification. A position of trust where accuracy would be valued. Understands Post Office. THETA, 4, Dagnall Park Villas, Selhurst Rd., South Norwood, S.E.

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WITH time for study. Within easy distance of Wills' preferred. By competent DISPENSER. Capable of taking charge in absence of principal. A., care Mr. Fisk, Chemist, Camberwell, S.E.

J. MASON, Chemist's TEMPORARY MANAGER, Cranham St., Oxford. Disengaged for 10 days. Terms 36s. per week, in-doors, with third class railway.

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AS JUNIOR in country business. 6 years' experience as Surgeon's Dispenser. Age 21. Good references. Would give first 6 months. T. W. UDELL, Albert Institute, Windsor.

JUNIOR. Well up in all branches. Age 23. Satisfactory references, &c. Disengaged. P., care of Yates & Co., Stationers, Dalston Lane, Dalston Junction.

EVENING employment, by advertiser. Age 30. Highest testimonials. 15 years' first-class experience. Minor qualification. B. A. T., 8 Duchess St., Portland Pl., W.

AS ASSISTANT. London preferred. 6 years' experience in town and country. L. C., 126, Upper St., N. .

TO Wholesale Drug Houses.—A gentleman (qualified chemist), with first-class references and ability, requires a post as TRAVELLER. A. G. S., 82, King's Rd., Chelsea, S.W.

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AS ASSISTANT. Out-door. Age 22. Height 5ft. 10in. 8 years' experience. Can Extract Teeth. Good references. BETA, care of A. Plant, Veterinary Surgeon, Bakewell.

WHOLESALE. Age 28. 9 years' varied experience. Good references. T. J. DOWNES, 44, Cumming St., Pentonville.

MANAGER, temporary or otherwise. Postal knowledge. Passed Minor. Good reference. Terms moderate. Age 31 years. ALPHA, 1 Garibaldian Villas, Somerset Rd., Tottenham, Middlesex.

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AN ASSISTANT. Not over 25 or 26 years of age. Apply, P. B., care of Messrs. Flood & Co., 102 and 103, Blackman St., Borough, S.E.

ASSISTANT, Wholesale, for wet room. Used to tincture making, &c. Apply, with particulars of age, salary, qualifications, Mr. HOLDSWORTH, 31, Steelhouse Lane, Birmingham. Applications not answered in three days may be considered declined.

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AN experienced ASSISTANT. To act as Manager. The highest references indispensable. Total abstainer preferred. Apply by letter first, stating age, height, and salary required, enclosing carte (to be returned), to A. B., care of 154, Coningham Rd., Shepherd's Bush, London. Unfurnished rooms for married applicant.

J. ANTHONY BASKER, Pharmaceutical Chemist, Bridgwater, requires a steady Junior ASSISTANT, for a good class country business. Age about 20. Apply, stating full particulars, and if possible enclose photo. (to be returned).

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A JUNIOR. About 19. As fourth hand. Must be neat-handed, quick and active. No Sunday duty. Apply personally, or by letter, enclosing photograph and full particulars, to W. MARTINDALE, 10, New Cavendish St., London, W.

AT once.—An active JUNIOR for Retail Counter. In or out-door. Short hours and no Sunday duty. Apply by letter only to J. K. M., care of Cooper Bros., 11, Long Acre, W.C.

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A COMPETENT and reliable gentleman, of active business habits, efficient as a Salesman and Prescriber, possessing unquestionable references, may secure a comfortable and social home with salary commencing £60 and increasing according to ability. A good JUNIOR requiring time for study. Enclose carte, with particulars, to F. V., 57, Charterhouse St., E.C.

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ASSISTANT. About 21. For general country business. In agricultural district. Two kept. Board in, but sleep out. Send photo., with full particulars, to JAMES TOMLINSON, Chelmsford, Essex.

JUNIOR ASSISTANT or IMPROVER. Not under 20 years of age. In a leading town in the North of England. Apply, stating particulars of previous engagements, and enclose references, to PHARMACIST, care of Messrs. Edwards & Son, Queen Victoria St., E.C.

JUNIOR ASSISTANT. To live out-doors. Small salary. Hours short. Apply, by letter, to K., 20, Royal Exchange, E.C.

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AN ASSISTANT. About 22 years of age. For a Dispensing business. Apply, stating age, height and salary (with carte, if convenient), to Mr. BULLEN, 36, Church Rd., West Brighton.

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JUNIOR. At once. About 21. Where oneonly is kept. Hours 8 till 10, with alternate Sunday duty. Salary to commence £35, with £5 extra to an abstainer. Apply, or send carte, to W. G. TAPLIN, 75, Hampstead Rd., London, N.W.

ASSISTANTS WANTED.

JUNIOR Assistant. Accustomed to Dispensing and good class business. Apply, stating age, salary required and references, with carte, to Foster & Else, 52, King's Rd., Brighton.

AN experienced Assistant. Must have been accustomed to first-class Retail and Dispensing. Apply personally, if possible. W. H. Bell, 96, Albany St., Regent's Park.

JUNIOR Assistant, steady and capable, required early in June. Thos. Bushby, Pharmaceutical Chemist, Manchester. State salary required, in-door, and give references.

AN Assistant for a country business. Out-door, and no Sunday duty. State age, height, salary required, and references from last employer, to E. G. Carrington, Bakewell, Derbyshire.

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The
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AND
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Pharmaceutical Society of Great Britain,

17, BLOOMSBURY SQUARE, LONDON.

ELIAS BREMRIDGE, Secretary and Registrar.

NOTICES.

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An Index of the ten Volumes of the *Pharmaceutical Journal*, from July, 1868, to June, 1878, has been compiled and printed, price 2*s.* 6*d.*, or by post, 2*s.* 8½*d.* Each Member and Associate of the Society will be supplied with one copy *gratis*, on application to the Secretary.

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* A Certificate of having passed any of the Examinations approved by the Council (a list of which may be obtained from the Registrar) will be accepted in lieu of this Examination, provided Latin, Arithmetic, and English were included in the subjects of the Examination for which the Certificate was granted.

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FOR 1883.

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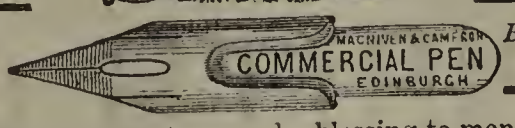
Commercial Pen. 

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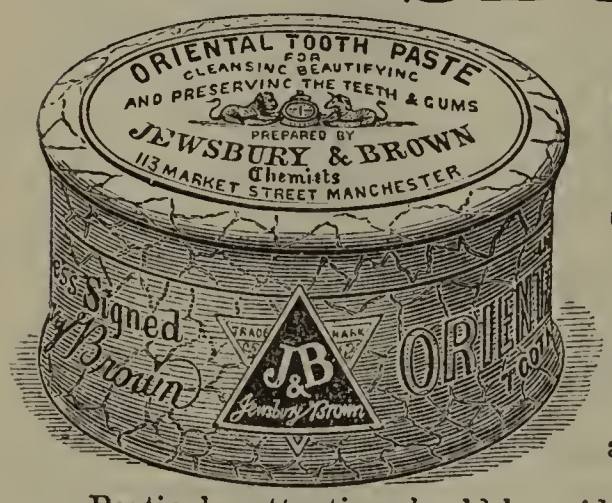

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TESTIMONIALS.

From the LANCET, *July 15th*, 1882.

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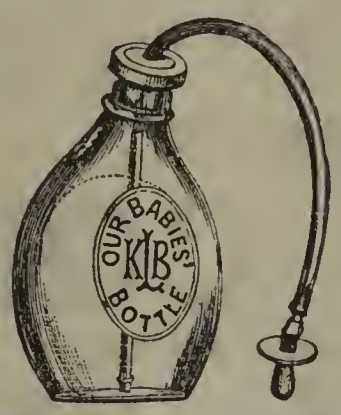

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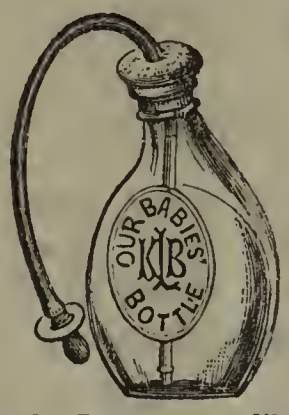

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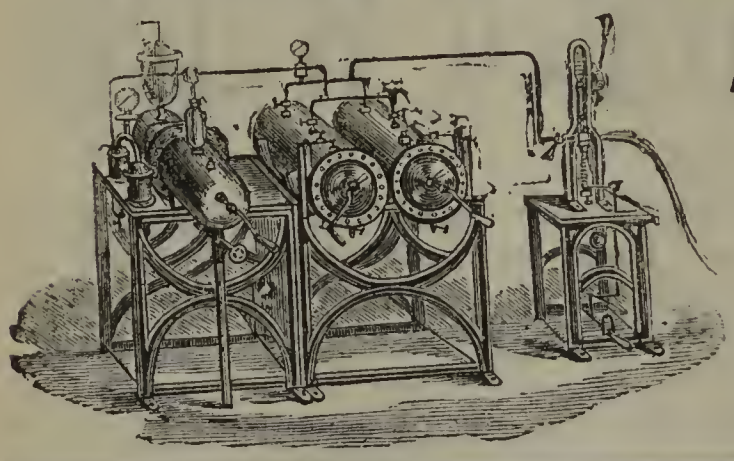

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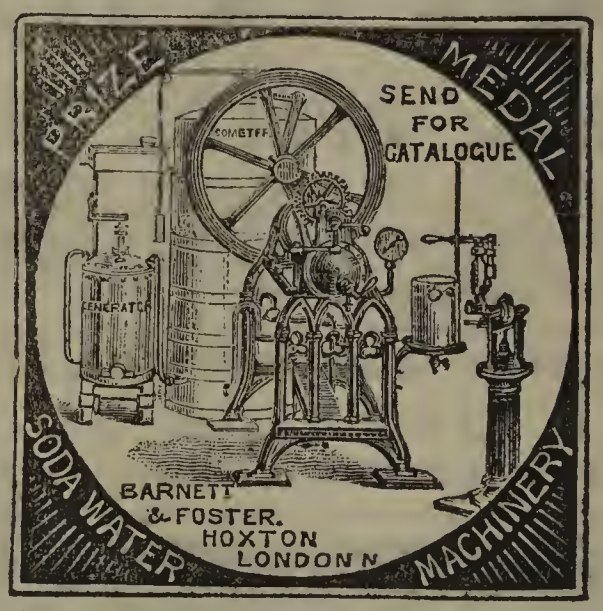

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The above quantities are for Lemonade and other Saccharine Drinks; if for Splits, reckon double; if for a very highly charged Soda Water, reckon half.

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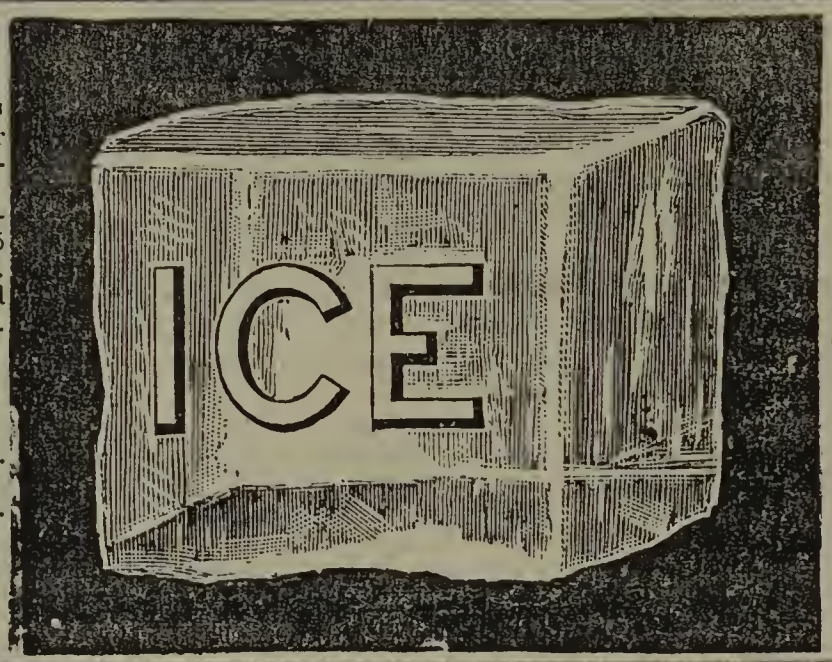

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IDRIS & CO. guarantee the purity of their waters.

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IDRIS & CO. manufacture all the waters of the British Pharmacopœia.

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"Is an ingenious and convenient device for inhaling chloride of ammonium fumes; by its use the chloride of ammonium is brought in more intimate contact with the mucous surfaces of the passage of the nose and throat than by any other form of inhaler."—*The Medical Press and Circular* Reports.

For full Notes and Reports see front pages of *The Lancet*, March 31st.

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THE LANCET says of the Kepler Extract of Malt: "The best known. and in this country the largest used Extract of Malt. It is as distinct an advance in therapeutics as was the introduction of cod-liver oil. It is one of our best remedies for atonic dyspepsia, and is undoubtedly useful in consumption and other wasting diseases." And further adds, "It is very good, and may be used with confidence."

For wasting diseases.

For full Notes and Reports see front pages of THE LANCET, March 31st.

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This is an emulsified combination of the purest fresh Norwegian Cod Liver Oil with 50 per cent. of Extract of Malt (Kepler).

So combined, the oil is sub-divided into minute particles which can be seen under the microscope to be as fine as the granules of milk; and so much finer than any that can be obtained by any emulsion with gums. On the fineness of the emulsion depends the digestibility of the oil. "The digestive change undergone by fatty matters in the small intestine consists mainly in their reduction into a state of emulsion, or division into infinitely minute particles."

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"Has been pronounced by some of our most eminent surgeons the very best absorbent for taking up discharges; it is very fine and soft, and acts instantly."—*The Medical Press and Circular.*

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EXACT SIZE OF TABLET.

"Are a great improvement on the hard, unpalatable lozenges which have so long done duty in the Pharmacopœia. The Chlorate of Potash and Chlorate of Potash and Borax will be found useful in throat affections, whilst the Bicarbonate of Potash and Bicarbonate of Soda Tablets will prove efficacious in dyspepsia. The Soda Mint, or Neutralising Tablets, will earn the gratitude of many a flatulent dyspeptic."—*The Lancet.*

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Hazeline.

The Medical Press and Circular reports:—"Hazeline is a valuable astringent remedy, wonderfully efficacious in checking *internal* or *external hæmorrhages*, and for *allaying inflammation.* It is particularly valuable in the treatment of *bleeding piles*, and as a *surgical dressing* it deserves attention."

For full Notes and Reports see front pages of *The Lancet*, March 31st.

The Wyeth Soluble Compressed Hypodermic Tablets.

The following formulæ and combinations embrace all those in general request. Others will be added as the demands of the profession warrant.

We claim for the Wyeth Hypodermic Tablets:

Absolute Accuracy of Dose.
Ready and Entire Solubility.
Perfect Preservation of the Drug.

Their convenience and utility will at once be apparent on examination.

Morphiæ Sulphas ....1-3 grain.	Morphiæ Sulphas ....1-8 grain.
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Morphiæ Sulphas ....1-12 grain.	Atropiæ Sulphas ....1-60 grain.
Morphiæ Sulphas ....1-3 grain.	Atropiæ Sulphas ....1-100 grain.
Atropiæ Sulphas ....1-120 grain.	Atropiæ Sulphas ....1-150 grain.
Morphiæ Sulphas ....1-4 grain.	Strychniæ Sulphas ..1-60 grain.
Atropiæ Sulphas ....1-150 grain.	Strychniæ Sulphas ..1-100 grain.
Morphiæ Sulphas ....1-6 grain.	Strychniæ Sulphas ..1-150 grain.
Atropiæ Sulphas ....1-180 grain.	

For full Notes and Reports see front pages of *The Lancet*, March 31st.

The Wyeth Dialysed Iron.

1. It is easily administered, the dose being very small.
2. It has no unpleasant taste or smell.
3. It does not irritate the stomach.
4. It has no effect on the bowels, producing neither constipation nor diarrhœa.
5. It does not blacken the teeth.

In ordering please specify Fer. Wyeth 3 oz. with Dropper.

NOTE.

All the articles mentioned on this page may be obtained from respectable Dispensing Chemists and Wholesale Druggists in every part of the world, or from the European Depôt of Burroughs, Wellcome & Co., Snow Hill, London, E.C. Our new Formulæ Book and Trial Specimens of any of our Preparations will be sent to any Member of the Profession upon request.

BURROUGHS, WELLCOME & CO., Manufacturing Chemists, Snow Hill, London, E.C.

"THE MONTH."

Although the proverbial May flowers were very slack in putting in an appearance during the early part of the month, the hot sunny weather of the last two weeks has made up in great measure for the backwardness of the season, the leaves and flowers having burst forth with a rapidity almost like that of a Scandinavian summer. Most of the medicinal plants usually in bloom in May can now be seen at the various Botanical Gardens; *Podophyllum peltatum*, *Carum Carui*, *Iris florentina*, *Polygonum Bistorta*, and many others, may be noticed in their respective natural orders. In the country, the heathy commons and railway banks are decked with the golden broom in the full blaze of its vernal beauty, undimmed by rain or wind. In bogs, where it is hardly safe to tread, one of the most beautiful of our wild plants, the bogbean (*Menyanthes trifoliata*), is putting forth its shortlived blossoms, and the male fern is unrolling its tender green fronds. On the wayside hedges and in cottage gardens the official aconite, *A. Napellus*, and *Vinca major* are coming into flower. Among the rare or less common British plants, *Geranium phœum*, *G. sylvaticum*, *Myrrhis odorata*, *Pinguicula grandiflora*, *Meconopsis cambrica*, *Gymnogramma leptophylla* and *Carex depauperata* may now be looked for. Most of these are now in blossom at Kew, where those who do not know these plants may make their acquaintance under the most favourable circumstances.

The change of colour in various boraginaceous flowers would seem to bear relation to their fertilization. Hermann Muller remarks in *Nature* (May 24, p. 81) that he has observed that insects visit exclusively those which are red or just beginning to change to blue. All the blue flowers which he examined in a locality about 2 yards broad and 20 long, where many hundred flowers of *Pulmonaria* were in all stages of development, proved to be empty of honey, and all which he observed with the aid of a lens had the stigma already supplied with pollen; so that it would appear that, as in *Lantana* and *Ribes aureum*, the change of tint serves as a guide to insects visiting the flower.

At this time of year it is not an uncommon thing to find the stem of *Juniperus Sabina* attacked by a fungus known as *Podisoma Sabinæ*. Hitherto it has been supposed that this fungus, which consists of a mass of teleutospores, immersed in a peculiar glutinous jelly, is a particular stage of development of a fungus found in autumn on pear leaves, called *Ræstelia cancellata*, and that the teleutospores of the savin fungus do not directly give rise to another growth of *Podisoma*, but to the *Ræstelia*. That eminent fungologist, Mr. Worthington G. Smith, states (*Gard. Chron.*, p. 604), on the contrary, that having put some of the *Podisoma* in water to moisten it, he found forty-eight hours afterwards that those teleutospores which had been moistened had germinated and had produced an enormous amount of promycelium and a prodigious number of secondary spores, some of which in their turn had germinated on the surface of the water; while of the portion of *Podisoma* unmoistened not a single teleutospore had germinated.

According to Mr. D. Morris (*Gard. Chron.*, May 12, p. 594) the *Stillingia sebifera*, the tree whose seeds yield the tallow so largely used in China for making candles, is now completely naturalized in the Southern States of America, and forms avenues in all open spaces in the city of New Orleans. It is said to be the only tree that has been found, so far, to stand the tremor or shaking of the ground caused by the continual passing of street cars.

Dr. Pritchard has called attention in the *Lancet* (May 12, p. 851) to the poisonous effects of a plant which is being sold under the name of *Ampelopsis japonica*, and which causes raised patches of inflammation, at first resembling nettle rash, but followed by large blisters, lasting for nearly three weeks, and in some cases returning a second and third time with almost equal severity after intervals of six weeks and two months respectively without fresh contact. This plant has been since identified as the *Rhus Toxicodendron*, which partakes of the poisonous nature of many of the Anacardiaceæ. To the action of this poison some persons are much more sensitive than others.

Another curious case of poisoning by some vegetable poison is recorded in the same Journal (*Lancet*, p. 843), in which the effects produced were doubtfully attributed in part to *Urtica urens* or *U. dioica*, and, indeed, somewhat resembled those attributed by Mr. N. E. Brown to *Laportea gigas* (*Pharm. Journ.*, [3], xiii., 441), an exotic member of the same natural order, and in part to some plant nearly allied to *Artemisia*, judging from the fact that the patient complained that everything seemed green to him.

About four years ago, Mr. Moens, of Java, succeeded in grafting successfully the *Cinchona Ledgeriana* and *C. succirubra*, and these seemed at first to bear out the opinion usually held by horticulturists that there is no transfusion of quality from stock to graft or *vice versâ*. The results of the recent analyses of bark from these two seem to prove, however, that while the bark of the *C. succirubra* is rendered abnormally rich in quinine by its junction with the *Ledgeriana* graft, the bark of the latter is deteriorated, so that it yields chiefly cinchonidine and cinchonine. Such results seem almost to indicate some accidental transposition of the barks before analysis, but if subsequent careful experiments confirm the asserted results, the stock and not the graft will be of the greater importance in the future (*Gard. Chron.*, May 26, p. 666).

Cinchona trees are now being cultivated in the Cape de Verde Islands, especially at St. Antao and St. Thomé, where, according to Professor Henriquez (*Gard. Chronicle*, May 5, p. 568), there are already thousands of plants of *C. succirubra*, *officinalis* and *Ledgeriana*, most of which have been sent from the Botanic Garden at Coimbra. Analyses of the bark of some of the trees have been made and with most satisfactory results. This is interesting, as the cinchona cultivation seems to have been a failure at St. Helena.

The conditions under which an infusion of the seeds of *Abrus precatorius* produce a purulent ophthalmia have been studied by M. de Wecker, who reports that it is due to the presence of a bacillus (*Comptes Rendus*, xcvi., 1440). He has found that if an infusion of jequerity seeds be sterilized, it is no longer capable of setting up the inflammation; but that if the bacillus be removed and cultivated separately, this will provoke the factitious ophthalmia which is the object of the treatment of the eyes with the infusion. M. de Wecker makes the important statement that when these inoculations of the mucus are carried very far, a transmission to the lymphatic

glands takes place, causing suppuration and erysipelatous symptoms, as well as a distinctly febrile condition.

In the *Lancet* Dr. P. S. Brito mentions the leaves of the "muringai" as being used in India in the treatment of hydrophobia, and suggests whether some constituent of the leaves may modify or counteract, in short, act as an antidote to the poison contained in the saliva, and asks for statistics and reliable experiments. The botanical name of the tree, which appears to be unknown to him, is *Moringa pterygosperma*, the native name having become the generic one. The tree is commonly known to European residents in India and Ceylon as the horseradish tree, from possessing similar properties to that plant. Its use in hydrophobia is unknown to Dr. Ondaatje, of Ceylon, and it is difficult to see how it could act as an antidote, unless the sulphuretted volatile oil it contains is proved to have a lethal effect on the bacillus of the disease.

Dr. Prosser James writes in the *Medical Press and Circular* (April 25, p. 353), recommending the fluid extract of *Rhamnus Purshiana* as an aperient, a drachm of this preparation being stated to act as freely as a pill or black draught, but like the latter it, unfortunately, has a bitter taste. In catarrh, when the stools are scanty, pale and putty-like, it appears to be of considerable service, acting partly as a cholagogue, while it irritates so slightly that it may be given when the patient is suffering from hæmorrhoids. Otherwise, this new American drug does not seem to possess any advantage over *Rhamnus Frangula*.

Dr. A. Hill Hassall has communicated to the *Lancet* (May 5, p. 765) the results of some experiments, made with various antiseptics, with a view to ascertain their degree of volatility at ordinary temperatures, and how far such substances are really useful in phthisis, when inhaled. He appears to have arrived at some singular results. Phenol was found to be very slightly volatile, and of the small quantity which passed off in vapour, part was lost in the respirator and part absorbed by the mucous membrane of the nose, mouth and fauces. The sputa did not smell of carbolic acid after inhalation, nor could the acid be detected in distilled water through which the expired air was passed. When dissolved in alcohol and chloroform, its volatility was lessened instead of being increased. Creasote was found to be slightly less volatile than carbolic acid, and thymol scarcely volatile at all at ordinary temperatures. Iodine, although very volatile, was found to be altered into an iodide by the saliva and mucus of the mouth and throat. Dr. Hassall concludes from his experiments that the most practical method of causing antiseptics to reach the substance of the lungs is by means of an inhalation chamber. Inasmuch as his experiments were performed at a temperature of about 48° F., the results he has arrived at need confirmation by experiments made with hot water before it can be taken as proved that antiseptics inhaled through an inhaler do not enter the lungs, since it is well known that many substances are volatile in steam which are not so at ordinary temperatures.

According to Dr. P. M. Chapman (*Practitioner*, May, p. 354) distilled water is not always the best vehicle for eye lotions, and a collyrium made with ordinary tap-water is less irritating than one prepared with the purest distilled water. This he accounts for by the fact that the normal lachrymal secretion contains about 1 per cent. of solids, chiefly chloride of sodium, and that water containing no salts approaches less nearly to the natural secretion than a water containing a small percentage. As a practical result of his experiments made from this point of view, he finds that the addition of 2½ grains of chloride of sodium to the ounce of distilled water renders any lotion intended to be of a soothing character much more beneficial.

In a paper read before the Berlin Medical Society (*Pharm. Zeit.*, p. 190) Dr. Levin has recently called attention to the manner of action of santonin. Whilst this substance is practically insoluble in water and dilute acids, it is more or less dissolved by saliva, the juices of the stomach, liver, intestines and pancreas, as well as by fats. All these, except the oily solutions, can be absorbed in the stomach, but the last only in the bowels. Santonin, as usually administered, acts most rapidly upon ascarides which reside in the small intestine, where the greater part is absorbed and takes effect, and does not consequently act upon the more deeply seated worms in the cœcum. Dr. Levin prefers, therefore, to use a solution in oil as being more gradual in its action, and not injuriously affecting the central nervous system. If such a solution be administered in capsules, an addition of a little oleum cinæ is recommended to assist its action.

With respect to the new hypnotic, paraldehyde, Dr. Quinlan reports (*Med. Press*, May 9, p. 401) that he has tried it on himself and others with satisfactory results, it producing quiet dreamless and refreshing sleep. Its action appears to resemble that of chloral hydrate, except that it has no depressing influence on the heart; neither does it interfere with the secretions, except sometimes to increase that of the kidneys. The dose for adults is from thirty to sixty minims, but Dr. Quinlan has not observed whether it becomes gradually tolerated so as to require the dose to be increased. The principal drawback is its persistent and acrid after-taste, which is said to be overcome by the following formula:—

℞	Paraldehydi	♏xxx.
	Aquæ	ad ℥jss.
	Syrupi aurantii	℥ij.
	Spt. chloroformi	♏xxx.

M. fiat haustus. Horâ somni sumend.

If the dose of paraldehyde be larger, the quantity of spirit of chloroform must also be increased. The recumbent position and complete quiet after administration are desirable.

Kairine, or oxychinoline methylhydrate, the new antipyretic introduced by Professor Filhne (see before, p. 444), is the subject of a paper recently read before the Paris Hospital Medical Society by Dr. Hallopeau (*Med. Times and Gaz.*, May 19, p. 574). The hydrochlorate of the base, in doses of 30 to 50 centigrams, given in a fever of moderate intensity every hour or hour and a half, is found to lower the temperature from the first dose, and after the third or fourth dose to bring it to the normal point, or even lower, the reduction being accompanied by profuse sweating, which, however, soon ceases if the normal temperature be maintained by means of fresh doses of the drug. Dr. Hallopeau has come to the conclusion that the action of kairine is more certain, powerful and rapid than that of any other antipyretic in non-poisonous doses.

In the *Practitioner* for March, Dr. Matthew Hay

directed attention to the use of nitrite of sodium as a substitute for nitrite of amyl. As the result of careful experiment, he found that although the action of the sodium nitrite did not manifest itself for two or three minutes, yet it completely relieved the pain of angina pectoris, instead of only dulling it, as is the case with nitrite of amyl, and that the action also persisted for a longer period than that of the amyl compound. He also found it less liable than nitroglycerine to produce throbbing pain in the head and giddiness. The only disagreeable effect met with was the eructation of nitrous acid gas when a full dose of the salt was given; but subsequent experiments, published in the May number of the same periodical, tended to show that unless compounds containing nitrous acid give rise to its liberation in the body, no remedial effect is produced in the treatment of angina pectoris, and that, therefore, this effect is favourable rather than otherwise. His experiments further lead to the conclusion that although all nitrites which have been tried on this dreadful disease owe their efficacy to the nitrous acid they contain, yet the nitrite of amyl owes it, in some degree, also to the amylic constituent. The dose of the nitrite of sodium varies from 1 to 4 or 5 grains, according to the purity of the salt. Dr. Hay states that he has had some difficulty in obtaining it pure; even when obtained from a London manufacturing firm of the highest eminence, he was astonished to find that the specimen analysed did not contain more than 33 per cent. of the nitrite. Another specimen, which he procured nearly two years previously, contained only a trace of the nitrite. If quite pure, Dr. Hay thinks that a dose of 2 grains, or even 1 grain, would probably be a sufficient dose. Its purity is, he states, easily estimated by means of a standard solution of permanganate of potassium.

In the *Practitioner* (March, p. 175) Mr. H. T. Butlin recommends the use of chromic acid in syphilitic affections of the tongue and lips and secondary affections of the tonsils and palate. The acid is used in the form of lotion of the strength of 10 grains to 1 ounce of water, the solution being painted on three or four times a day with a camel's hair brush. The application is said to give only a little pain at first.

The use of iodine associated with the sedative alkaloids of opium is advocated by M. Delbovier, in a paper submitted to the Academy of Sciences (*Comptes Rendus*, xcvi., 1412), as a preventive of typhoid fever, and as a remedy of that disease if administered in its early stages. In the latter case it is alleged to control the fever, so that the temperature remains normal and there is an absence of delirium and complications of any kind. When administered later the remedy is not so efficacious, which M. Delbovier appears to attribute to the fact that whilst it is capable of preventing the injurious action of the microbes to which the fever is due, it is ineffective to repair the damage when done. No particulars are given as to the dose or manner of administration.

Another new dressing for wounds has been introduced by Professor Bruns (*Med. Times and Gaz.*, May 26, p. 587) under the name of "wood-wool." The raw material consists of disintegrated fibre of fine-grained wood, such as is used in paper making, the fibre of *Pinus picea* being preferred, as being poorer in resin than the wood of other pines and firs. The ordinary fibre is reduced to a finer state of division by being rubbed through a wire sieve; it is then dried and afterwards saturated with an antiseptic. The antiseptic recommended is $\frac{1}{2}$ per cent. of corrosive sublimate and 10 per cent. of glycerine, this percentage apparently referring to the ratio between these substances and the wood-wool. This wood-wool is said to possess the property of absorbing liquids to the extraordinary extent of taking up twelve times its own weight, so that 10 grains of it when completely saturated weighs 130 grains.

According to M. Izard (*Bull. Soc. Ph. du Sud-Ouest*, vii., 82) a solution of ferrous iodide, which will retain permanently the green colour characteristic of the proto-salts of iron, may be obtained by adding a few drops of alcohol to the preparation as soon as the combination of the iodine with the iron is completed. M. Izard appears to think that the alcohol undergoes dehydrogenation, and that the resulting aldehyde is capable of neutralizing the action of oxygen.

The researches initiated by M. Pasteur upon the alcoholic ferments promise to have an important influence not only upon beer brewing but upon the apparently less artificially conducted process of fermentation that goes on in the production of wine. It seems quite probable that the quality of the wine of any year is as much affected by the particular mould which predominates during the fermentation as by the amount of sunshine or rain during the growth of the grapes or even the passage of a comet through the sky. In Germany it is already the practice to sterilize the must and then to sow it with some selected ferment, a process favourable to the elimination of various "false" ferments (species of *Dematiei*) that are common to the surface of the grape and other fruit, whilst the custom in some southern countries of decanting the must as soon as the first foaming appears may have the same effect. In a recent communication (*Comptes Rendus*, xcvi., 1369) M. Le Bel incidentally remarks that last year none of the grape collection with which he had to do underwent fermentation influenced by what Pasteur considers to be the true wine ferment, *Saccharomyces ellipsoides*, Rees, but was all fermented by *S. pastorianus*. M. Le Bel also states that a natural must yields a larger proportion of the higher alcohols than a solution of sugar fermented with the same ferment. This observation has an important bearing upon the keeping of the "wines" now so largely manufactured from sugar solution in which grape skins have been steeped.

The opinion that the higher alcohols of the ethylic series are more poisonous in proportion as the complexity of the molecule increases has been expressed by various authorities, especially Nothnagel and Rossbach, and this opinion now receives confirmation by a series of experiments published in the *Practitioner* (p. 339) by Drs. Ringer and Sainsbury, who prove (at least, with regard to the heart of the frog) that the different members of the ethylic series have a similarity of action and indicate the probability that the constant chemical difference between these alcohols is corresponded to by a constant physiological difference, each CH_2 group increasing the activity by a definite amount. By their direct action on the tissue of the heart these alcohols are paralysing in their effect from the first without any preceding increase of action. The importance

of having alcoholic drinks free from the higher alcohols of the ethylic series is therefore clearly proved.

In the last number of *Archives Italiennes de Biologie* a further account is given of the ptomaines by MM. Guareschi and A. Mosso. From decomposing fibrin they obtained a base having in all probability the formula $C_{10}H_{13}N$, isomeric with tetrahydromethylquinoline of Jackson, a compound having also similar properties to that of the ptomaines. They also obtained a ptomaine from decomposed human brain, which in its physiological effect upon frogs resembled curare, though feebler and more transient in its action. The ptomaine from fibrin had a similar effect to that obtained from brain, the chloroform solution of the former being more powerful than the hydrochlorate. Great care was taken by the experimentalists to ascertain the purity of the alcohol used for extracting the ptomaines and its freedom from poisonous alkaloids. Operating on about 50 litres of alcohol they found in it a small quantity of a base which was either pyridine or closely allied to it. This base is also sometimes found in amylic alcohol in as high proportion as 1 per cent., and being itself toxic, might lead to serious error. Other investigators have also demonstrated the presence in commercial alcohol of a mixture of substances belonging to the picoline series and also of collidine (*Lancet*, May 12, p. 828).

The *Répertoire de Pharmacie* quotes, upon the authority of Dr. Nessler, a recipe for an insecticide which is said to have a great reputation among German horticulturists. It consists of soft soap, 4 parts; extract of tobacco, 6 parts; amylic alcohol, 5 parts; methylic alcohol, 20 parts; water to make 1000 parts. The extract of tobacco is made by boiling together equal parts of roll tobacco and water for half an hour, adding water to make up for what is evaporated. The soft soap is first dissolved in the water with the aid of a gentle heat, and the other ingredients are then added. The mixture requires to be well stirred before it is used, and is applied by means of a brush or a garden syringe fitted with a small rose.

A substance resembling copaiba balsam, but of unknown botanical origin, which, in 1854, was imported under the name of "lagam balsam," from Padang in Sumatra into Rotterdam, where it passed into the hands of Dr. De Vrij, has been closely investigated by Herr Haussner (*Archiv*, xxi., 241). He found that lagam balsam yields upon distillation about one-third of its weight of an essential oil, having the same composition ($C_{20}H_{32}$) as those from gurjun balsam and copaiba balsam. Indeed, lagam balsam appears to differ from gurjun balsam only in an acid resin, which could not be got to crystallize, whilst the acid resin obtained by Werner from gurjun balsam ('Pharmacographia,' 2nd edit., p. 90) was crystallizable and probably had a higher molecular value. Herr Haussner assumes therefore that lagam balsam has a botanical origin similar to gurjun balsam, or wood oil, which is referred to species of *Dipterocarpus*.

The composition of the larch agaric (*Polyporus officinalis*) has been the subject of varying statements, which will now probably be disposed of by an investigation carried out by Herr Jahns. He states (*Archiv*, xxi., 260) that he finds it to yield to hot alcohol: (1) 16 to 18 per cent. of a bibasic triatomic acid (Fleury's "agaricic acid"), homologous with malic acid, being represented by the formula $C_{16}H_{30}O_5+H_2O$, and which melts at 138° to 139° C.; (2) 3 to 5 per cent. of a neutral body, apparently an alcohol, crystallizing in needles, melting at 271° to 272° and capable of sublimation; (3) 3 to 4 per cent. of a white amorphous body, which separates in a gelatinous form from solutions; and (4) 25 to 30 per cent. of an amorphous red resinous mixture, of acid reaction, easily soluble in alcohol and ether, and having a bitter taste. This mixture contains the active purgative principle of *Polyporus officinalis*, and is the "larch fungus resin" and "red resin" of other authors. Herr Jahns considers agaricic acid, which Fleury represented by the formula $C_{24}H_{44}O_7$ (*Pharm. Journ.*, [3], vi., 862), to be identical with the "laricin" of Martius and essentially the same as the "agaracin" of Schoonbroodt and probably as the "pseudowax" of Trommsdorff. The silver, potassium, sodium, ammonium and barium salts of agaricic acid are described.

Under the name of "cinchocerotin," Herr Kerner sent to the exhibition in Paris in 1859 a substance which had gradually been deposited in some copper tubing during the cooling of an alcoholic decoction of a dried paste of South American flat calisaya bark and milk of lime. It has been recently examined by Herr Helms, who states that the crude brown cinchocerotin yields two different constituents, one easily soluble in alcohol, white and crystalline, and a much smaller quantity of a yellowish-white substance difficultly soluble in alcohol. The crystalline substance, for which he proposes to retain the name "cinchocerotin," melts at 130° C., sublimes with partial decomposition when heated higher, and is freely soluble in ether, chloroform and alcohol, but insoluble when boiled with water, hydrochloric acid, dilute sulphuric acid and acetic acid. Its composition is represented by the formula $C_{27}H_{48}O_2$, but the behaviour of the acid resulting from its oxidation indicates that it has possibly a higher molecular weight. From the results obtained it is evident that cinchocerotin is neither a wax nor a fat, and its properties and occurrence probably place it in the neighbourhood of betulin and cerin.

Professor Flückiger in a note to the *Berichte* (xvi., 1143) points out that he has described a potassium carbonate similar to that investigated by Rammelsberg (*Ber.*, xvi., 273, and before, p. 800) in the *Swiss Journal of Pharmacy* for 1856. It was obtained from an efflorescent mass of crude potash which had been exposed to the air. The salt dissolved in 3 parts of water at 15° C., giving a solution which was not precipitated by the addition of magnesium sulphate. It may be considered as formed upon the type of an acid produced by the abstraction of one molecule of water from three molecules of carbonic acid, thus— $3H_2CO_3-H_2O=H_4C_3O_8$. The potassium salt of this acid would have the formula $K_4C_3O_8$ which agrees with the formula induced from the figures obtained by the analysis of the above salt. This potassium pyrocarbonate, as it may by analogy be called, crystallizes in white needles containing six molecules of water, so that the formula of the crystalline salt would be $K_4C_3O_8 \cdot 6H_2O$, or representing it as a compound of one molecule of normal potassium carbonate with two molecules of acid potassium carbonate ($K_2CO_3,2KHCO_3,3H_2O$).

The experiments of Messrs. Heumann and Koechlin (*Ber.*, xvi., 479) had led these observers to state that the vapour density of pyrosulphuryl ($S_2O_5Cl_2$)

is abnormal at a temperature at 184° C.; the theoretical vapour density being 7·4, while at this temperature the vapour density was found to be only 5·84. At higher temperatures the density becomes still less, thus at 212° C. it is 4·77, and at 452° C. 2·58. These authors ascribed this abnormality to the gradual dissociation of the pyrosulphuryl chloride, which is complete at 442° C., thus, $S_2O_5Cl_2=SO_2+SO_3+Cl_2$; that is, 2 volumes of pyrosulphuryl chloride become dissociated into 6 volumes. The substance used in these experiments was prepared by two different methods: first, by the method of Rose by the distillation of sulphuric anhydride with chloride of sulphur; and second, by a method proposed by Heumann and Koechlin, consisting in the distillation of chlorosulphonic acid with phosphoric anhydride. Herr Konowalow (*Ber.*, xvi., 1127) criticizes the work of the above observers, and maintains, in accordance with his former experiments (*Compt. Rend.*, xcvi., 1059), that pure pyrosulphuryl chloride, which has a boiling point of 153° C., does not suffer dissociation at 184° C. or even at 210° C., but has the normal density of 7·4. Konowalow attributes the abnormal vapour densities obtained by Heumann and Koechlin to the employment of impure pyrosulphuryl chloride. He details experiments which show that by the method of Rose it is extremely difficult to obtain the pure substance. By two successive fractional distillations and collection of the portion distilling between 152° and 153° C., pyrosulphuryl chloride was obtained, which gave the vapour density 7·2; that is, it was normal. A similar difficulty was experienced in obtaining pure pyrosulphuryl chloride by the action of phosphoric anhydride upon chlorosulphonic acid. The distillate thus obtained gave extremely abnormal vapour densities in accordance with the experiments of Heumann and Koechlin; but after constantly distilling the mixture and collecting the portion boiling between 152° and 153° C., the distillate gave a vapour density of 7·1. Konowalow shows that it is fallacious to rely, as Heumann and Koechlin did, upon chemical analysis as an indication of the purity of this body. An admixture of chlorosulphonic acid sufficient to give an abnormal vapour density is not revealed by chemical analysis, that is, the results only show an error that would usually be allowed as experimental. The boiling point of the substance is the most trustworthy guide to its purity. Another source of error is also pointed out and experimentally proved by Konowalow. Pyrosulphuryl chloride is decomposed by the least trace of moisture (*Compt. Rend.*, xciv., 217), and consequently, when V. Meyer's method is employed, as it was by Heumann and Koechlin, for determining the vapour density, the apparatus must be filled with dry air before the experiment is commenced. Neglect of this precaution is shown to reduce the normal vapour density to 5·9.

Professor Spring, whose researches upon the formation of chemical compounds by pressure are well known, has obtained (*Ber.*, xvi., 999) a great number of the metallic sulphides by submitting a mixture of the two elements in a fine state of division to a pressure of 6500 atmospheres. In the case of magnesium a polysulphide was obtained, which dissolved in water with a yellow colour, as well as the normal sulphide. Sulphide of zinc was obtained in a form resembling blende, and possessing a crystalline fracture. A polysulphide was also obtained. The sulphides of iron, cadmium, aluminum, bismuth, lead, silver, copper, tin and antimony were in like manner produced. Sulphur and carbon did not combine to form bisulphide of carbon, neither did amorphous phosphorus and sulphur unite. Under ordinary conditions these two latter substances, when heated together, do not combine until the temperature rises above 260° C., and at this temperature the amorphous phosphorus is converted into the yellow variety. Spring's former experiments had shown that in the case of allotropic bodies it is possible to convert, by pressure, the modification having the less specific gravity into the variety having the greater specific gravity, but not *vice versâ*; thus the present result is in harmony with this, for amorphous phosphorus has a higher specific gravity (2·1) than the yellow variety (1·8).

Professor Spring has also discovered (*Ber.*, xvi., 1142) a colloidal condition of copper sulphide, in which state it is easily and completely soluble in water. The substance was prepared by completely precipitating a dilute solution of ammonio-sulphate of copper with sulphuretted hydrogen. The black precipitate was washed by decantation for one week with sulphuretted hydrogen water, and when every trace of ammonium sulphate and sulphydrate had disappeared the copper sulphide began to dissolve, yielding a black solution with a slight green fluorescence. On filtering the dark colour is not removed, and the solution is perfectly clear. The liquid is not decomposed by boiling, and upon evaporation over a water-bath, the sulphide remains as a black varnishy residue. The solution is decomposed on the addition of even a small quantity of saline solution. The precipitated copper sulphide loses this colloidal property after it has been dried in a vacuum at ordinary temperatures. It is a remarkable fact that the dried copper sulphide is not black, but a fine dark green colour, and when exposed to a pressure of 6500 atmospheres, the mass is found to have a dark blue metallic lustre.

A remarkably sensitive double sulphate of iridium and potassium ($Ir_2.3SO_4+3K_2SO_4$) has been obtained by M. Boisbaudran by dissolving in water charged with neutral potassium sulphate the product of the treatment of iridic compounds with potassic bisulphate at a dull red heat (*Comptes Rendus*, xcvi., 1406). It is soluble in water or water acidulated with sulphuric acid, but is nearly insoluble in a saturated solution of neutral potassium sulphate. From a hot saturated solution it is deposited upon cooling in transparent green crystalline grains that are without action upon polarized light. The double sulphate is not modified by boiling, if the solution be fairly acid; but when the solution approaches neutrality, or contains a certain quantity of neutral potassium sulphate, the green colour rapidly gives place to a very pale rose tint. At this point the addition of ammonia or potash causes the separation of all the iridium as an oxide, soluble in dilute sulphuric acid with a rich violet colour. In a cold solution of the double salt a slight excess of potash changes the green colour to a pale blue, without any immediate precipitation; but if the liquid be heated, it develops rapidly a magnificent violet tint, and the iridium is quickly precipitated as a beautiful blue violet oxide, forming a violet solution in dilute sulphuric acid. The reactions can be utilized in the recognition of minute quan-

tities of iridium in the presence of gold, platinum, ruthenium and rhodium.

Having succeeded in effecting the liquefaction of oxygen (see before, p. 882), Messrs. Wroblewski and Olszewski turned their attention to nitrogen (*Comptes Rendus*, xcvi., 1225), but this gas even when cooled to −136° C. and submitted to a pressure of 150 atmospheres remained still unliquefied. Upon suddenly removing the pressure, a tumultuous ebullition was perceptible throughout the tube, similar to that observed when a tube containing liquefied carbonic anhydride is plunged into water at a temperature above the critical point of that body. When, however, the pressure was reduced slowly, and care taken not to reduce it below 50 atmospheres, the nitrogen was liquefied completely, forming a colourless and transparent liquid, with a very distinct meniscus, but evaporating very rapidly. In order to maintain the liquid condition for a longer time it will be necessary to reduce the gas to a temperature below the minimum point yet reached. The experimenters, by following the same method, subsequently succeeded also in liquefying carbonic oxide, obtaining it as a colourless liquid, with a distinct meniscus, and they propose to apply it in the liquefaction of other gases.

Dr. Drinkwater (*Analyst*, April) has discovered that the small quantities of selenium present in some samples of commercial sulphuric acid exert a powerful action on mineral oils distilled from shale, the use of acid thus contaminated in refining the crude shale products entailing loss together with deterioration in quality. The author believes that the olefins are chiefly acted on, compounds being formed analogous to sulphovinic acid, and further that this action increases the quantity of tar, of which a portion would be broken up during the subsequent distillation and pass over with the oil, imparting a bad colour to it. The author also states that acid containing selenium cannot be used by brass-wire workers, such acid blackening the wire; and, further, such acid, when boiled with gas liquor to form sulphate of ammonia, is found to give to the solution a dirty brown to black colour.

Professors Ayrton and Perry have contributed an interesting paper "On the Resistance of the Voltaic Arc" (*Phil. Mag.*, May, p. 346). The results obtained showed that at first the difference of potentials necessary to maintain the arc increased rapidly with the distance, and that at a distance of about one-tenth of an inch it was about 60 volts. This increase continued up to one-quarter of an inch distance, after which the difference of potentials necessary became nearly proportional to the increase of distance, being about 54 volts per inch increase. The experimenters plotted these results, and obtained a curve for the increase very like that obtained by Mr. C. F. Varley for the discharge through a vacuum tube, and by Drs. W. de la Rue and Hugo Müller for the connection between the electromotive force and the distance across which it would send a spark. The result of the experiments showed that the difference of potentials between the carbons necessary to produce an arc depends almost entirely on the distance between them, and hardly at all on the strength of the current. Messrs. Ayrton and Perry express an opinion "that in all probability the conduction from particle to particle in a microphone is of the nature of a small electric arc, or rather, perhaps, a convective discharge."

A NEW ALKALOID IN CANNABIS INDICA.

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Preliminary Notice.

Cannabis indica, or Indian hemp, is exceptional as a narcotic plant in respect of no alkaloid, possessing the action of the plant, having been as yet separated from it. The so-called cannabine obtained by T. and H. Smith, of Edinburgh, many years ago, and said by them to possess the active and narcotic properties of the cannabis, is certainly not a pure principle, and is, probably, a mixture of resin with varying proportions of the narcotic principle. It possesses almost solely the characters of a resin, and is described by the Smiths as such; but were it the true active part of the plant, it is certainly far removed from all other narcotic principles, inasmuch as none of them is chemically related to the class of resins. One specimen of cannabin which I obtained some time ago from Merck, of Darmstadt, and which, I was given to understand, was prepared exactly according to Smith's process, possessed little or no narcotic action.

A few years ago, Preobraschensky (*Pharm. Zeitsch. f. Russland*, 1876, p. 705) made a chemical examination of a quantity of haschisch which he brought with him from China, whither in 1873 he had accompanied an expedition, and was enabled, according to his own statement, to separate from it a volatile alkaloid, which he held to be identical with nicotine, and which he believed to be the active part of cannabis. This, in view of the distinctive and very different action of cannabis, was somewhat remarkable. It is highly probable, as has been suggested by Dragendorff and Marquiss (*Pharm. Zeitung*, 1877), that the haschisch used by Preobraschensky was mixed with tobacco, which it often is in Eastern countries.

Recently Louis Siebold and Bradbury have reported to the British Pharmaceutical Conference (1881) that, after an elaborate investigation, they have arrived at the conclusion of Dragendorff and Marquiss, and that in the course of their investigation they made the interesting discovery that pure cannabis does actually contain a volatile alkaloid, which does not, however, possess the characters of nicotine. They separated it in very small quantity, obtaining not more than 2 grains from 10 pounds of Indian hemp. They give to it the name of cannabinine. They record no observation as to its physiological action; and they, therefore, leave it doubtful as to whether this volatile alkaloid is the narcotic principle of cannabis.

It is evident from these and many other researches that it is no easy task to arrive at correct conclusions as to the active principle of cannabis indica.

A considerable time ago, I commenced a chemical examination of this drug, at the suggestion of Professor Schmiedeberg, of Strassburg, the results, so far, of which lead me to believe that cannabis indica contains several alkaloids. In a future communication I hope to be able to give an exact description of the distinctive characters and toxic action of each. In the meantime, I shall content myself with the description of one which I have obtained in a considerable degree of purity, and one which, rather remarkably, possesses an action similar to that of

strychnia. It is evidently, therefore, quite a secondary alkaloid of the cannabis, and reminds one of the thebaine of opium.

This alkaloid was obtained from a watery infusion of powdered cannabis indica by treating it with a solution of subacetate of lead, and filtering. To the filtrate was added ammonia, and the precipitate removed by filtration. The filtrate, acidulated with sulphuric acid, was now treated with a solution of phospho-wolframic acid in order to precipitate the alkaloids present. The precipitate, which was fairly abundant, was, after the fluid had been removed by filtration and washing with dilute sulphuric acid and pressing, mixed with barium hydrate and water, which formed an insoluble wolframate and set free the alkaloids. The filtrate was now deprived of its excess of barium by means of a stream of carbonic acid gas and again filtered. The filtrate was at a gentle heat evaporated almost to dryness and acidulated with sulphuric acid and treated with absolute alcohol. The sulphate of the alkaloids thus formed was partially soluble in alcohol, partly not. It was from the soluble part that the alkaloid in question was procured. The sulphate was converted into a chloride by treatment with barium hydrate, afterwards with carbonic acid to remove excess of barium, and, finally, with hydrochloric acid to neutralization. The chloride was evaporated and treated with absolute alcohol, in which it in part dissolved. From the solution, by addition of excess of carbonate of soda and frequent shaking with ether, an alkaloid was obtained in the form of colourless needle-like crystals.

The alkaloid was easily soluble in water, soluble also in alcohol, and more slowly soluble in ether and chloroform. It caused tetanus in frogs in exactly the same manner as strychnia, increasing the excitability of the reflex centres of the spinal cord. It did not give a violet colour with sulphuric acid and bichromate of potash. It was, therefore, although similar in action to strychnia, not chemically identical with it. A solution of it in water was precipitated by the various alkaloidal precipitants, platinic chloride, iodide of potassium and mercury, phosphotungstate of soda, phospho-molybdic acid, phospho-wolframic acid, etc.

Although I obtained the alkaloid from 1 kilogram of cannabis, yet the quantity of it was so small, that it was insufficient for an elementary analysis.

To this alkaloid I propose to give the name of tetano-cannabine, as indicative of its action.

MANUFACTURE OF TARTARIC ACID.*

BY L. H. FRIEDBURG, PH.D.

In the United States, tartaric acid is hardly manufactured for its own sake, but its preparation is unavoidably attached to the manufacture of cream of tartar. Here the starting points for tartaric acid are sablons, waste liquids and residues of different kinds, which render an analytical control troublesome, so that, partly because of great dilution, the raw material is treated more or less empirically, after the known and often described methods† with chalk and chloride of calcium or gypsum.

Abroad, the manufacture of tartaric acid is not everywhere a mere appendix to cream of tartar manufacturing, but forms an independent branch of manufacture. In such cases the raw material consists either of argols or of dry sablons, or of lees.

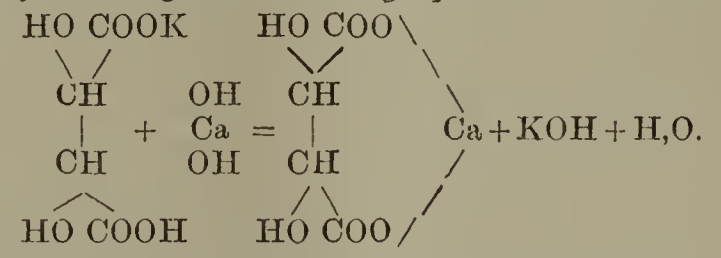
A careful analytical test has to be made before treating either of these mother-substances, and the manufacture has to be carried on with the greatest care, in order to avoid loss.

Until very recently, these tartaric acid factories worked generally after the old plan, as indicated above, viz.:—treatment with chalk and chloride of calcium or gypsum. But it has to be recorded, and I will briefly do so in the following pages, that a very neat and new patented process, which, according to my own experience, is commendable, is now also in use.

This process is based on the decomposition of the mother-substances, as named above, by slaked lime, instead of chalk. This preparation has been hidden in the European patent* under the heading, "Methods of obtaining the Potassium in the form of Hydrate, while making Tartaric Acid out of Argols."

This heading is practically speaking untrue, because, as we shall see later on, the potassium is not finally gained as hydrate, though this is in course of treatment formed, and then transformed into sulphate or chloride.

The chemical process which takes place in decomposing the bitartrate of potash in any mother-substance into tartrate of lime, by means of slaked lime, is very simply conveyed through the following equation:—



The practical difficulty which stood for so long a time in the way of realizing this decomposition for manufacturing purposes was the difficulty of making the products of decomposition easily filterable.

This the patentees have really overcome, and the method of working is smooth, and goes like clock-work.

Slaked lime, freed from coarse pieces, is taken, in necessary quantities, and a milk, not too thin, prepared therefrom.

This is heated to boiling, and argols, etc., in necessary quantity, are very gradually, and in a state of finest powder, introduced into the boiling mass.

The charging finished, boiling has to continue for two hours, the condensing steam being enough to keep the mixture in a concentrated form.

Hydrate of potash and neutral tartrate of lime are formed in this way. The nitrogenous organic impurities of the raw materials are, by the combined action on them of lime and hydrate of potash, decomposed so as to form ammonia gas, which is volatilized with the steam.

Boiling done, which takes place in an iron tank, the mixture is diluted by enough cold water, and then the potash is neutralized by either muriatic or sulphuric acid. The process is finished with the help of litmus paper.

Here the ammoniacal exhalations are to be considered, so as not to disturb the reaction. The decomposition, as described above, takes place under constant stirring by means of an iron stirrer run by machinery.

After the formation of either chloride or sulphate of potash, the mass is still more diluted with cold water, and stands best over night, stirring going on continuously, filtration then taking place the next morning. Here filter presses are used to great advantage.

It is advisable not to use too high pressure, so as to get a soft cake, which can more easily be washed out, in order to get rid of the mineral potash salts.

These latter are either boiled down, as long as the

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* From *Journ. of Amer. Chem. Soc.*, vol. iv., Dec., 1882.

† *Berichte über die Entwickelung der Chem. Industie*, A. W. Hofmann, vol. ii., p. 418, etc.: *Journal of the Society of Arts*, Robert Warington, vol. xxiv., p. 366, etc.

* *Die Chemische Industrie*, Dr. Emil Jacobsen, 1879, pp. 86 and 238; *Berichte d. Deutschen Chemischen Gesellschaft*, 1879, p. 1366.

strength of the solution makes it pay, or they might* be treated with chloride of lime (bleaching powder), and thus transformed into chlorate of potash, which I advise manufacturers to try. The cakes of brown tartrate of lime, which begin to exhale putrid odours by standing too long in a warm place (in summer time six hours' standing often will show this result), have speedily to be decomposed by sulphuric acid. This decomposition takes place in a wooden, lead-lined tank, with heavy wooden stirrer moved by steam.

The decomposition takes place in the cold, and its completion is determined easily by methyl violet test-paper.†

No analysis has to be made here, if good paper is at hand, which allows one to guide the reaction, so as to get the necessary point or the excess of sulphuric acid wished for.

The brown solution of tartaric acid is filtered through filter-presses into wooden receivers. It is not advisable to evaporate this acid down to the point of crystallization, because it contains impurities enough to spoil the mother-liquors at a too early stage. If the course of manufacturing demands a readier transformation of raw material into money, this crude acid solution might be concentrated in the leaden pans to the right concentration for crystallizing or for precipitation by the stirring process.

It is preferable to reprecipitate this acid as tartrate of lime, finishing the reaction with chalk, and using litmus test paper.

The tartrate of lime thus obtained is filtered on a vacuum filter or by centrifugal power. Of course washing takes place, though slightly. This tartrate of lime is crystalline, light greenish-yellow, and keeps perfectly well for any length of time required without decomposing.

It is decomposed in an apparatus similar to the one used for decomposition of the first brown tartrate of lime, by sulphuric acid, in the cold, and the reaction finished with the aid of methyl violet test paper. The filtration of the very white gypsum thus obtained cannot be done through filter presses, but has to take place on a vacuum filter, very thorough washing being required.

The tartaric acid solution thus obtained ought to stand between 12° and 14° B. It is ejected into the lead pans, evaporated at 80° C. to the necessary density by which dissolved gypsum is precipitated, run into the crystallizing boxes, and let stand for crystallization. The crop of brown crystals is redissolved to a liquid of the density 25° B., and treated with bone black which has been purified by muriatic acid (so as not to leave a trace of phosphates) at a medium temperature and under stirring.

The discoloured liquid is run through a filter-press, and thence into special lead pans. It is evaporated down to about 39° to 40° B., and run into lead boxes for crystallization.

The crystallization being a comparatively slow process, this liquid may be run into a proper tank with stirrer, stirred for several hours, thus yielding a crop of small crystals right away.

Either crystals are washed and dried in centrifugals by using steam for washing.

The liquid running off from the first crystallization yields after evaporation another crop of white crystals. Then it becomes a brown mother-liquor.

The mother-liquors of the brown crystals can, under careful attention, be carried along through the sixth or seventh crystallization. Then the predomination of sulphuric acid and impurities does not allow further crystallization.

The mother-liquors at that stage are diluted to a proper density, the greater part of the sulphuric acid removed by the addition of slaked lime milk, and the filtered liquid has then principally to be freed from iron salts and from phosphate of alumina.

* In case chloride of potassium was formed.

† *Journal of the Amer. Chem. Soc.*, T. O'Connor Sloane, vol. iv., nos. 1–4, page 31, etc.

The iron is easily expelled by taking care to keep it in the form corresponding to the protoxide, the presence of the phosphate of alumina making it necessary to treat the liquids boiling with milk of lime, thus precipitating phosphate of alumina, and forming an acid tartrate of lime which is soluble. It has to be filtered hot, and is decomposed by an addition of sulphuric acid, thus yielding very pure solution of tartaric acid.

If a transformation of the acid thus gained into bitartrate of potash should be wished for, which hardly would be prudent, the simplest way of arriving at this end would be the following:

The solution is divided into two equal parts, one half saturated by caustic or carbonate of potash, so as to form a neutral tartrate of potash, and then the other half added for the precipitation of the bitartrate.

CHLORIDE OF ZINC TOW.*

BY EDWARD HIRSCHSOHN, MAG.PHARM.

The employment of tow or oakum,† as a dressing for wounds is quite old. According to Gerdy,‡ tarred tow (oakum) was much used towards the end of the time of Hippocrates. Its antiseptic property was highly recommended, and it found extensive employment in the American war of the rebellion. In 1880, Dr. Weljaminow § reported that tow, which had been treated shortly before application with a 10 per cent. carbolic spray, was used successfully in Dr. Reyher's clinic in St. Petersburg. For some time past, also, dry tow impregnated with chloride of zinc has been used as a cheap substitute for the expensive salicylated cotton in the surgical clinic of Professor von Wahl, in Dorpat. A report on the success of this method of treatment has been made by Dr. Drombowsky,‖ the present clinical assistant, who states that the dressing is prepared in the following manner:—

"The tow was picked, carded, and then placed in an oven arranged for sulphur disinfection. After having been exposed for twelve hours to the vapour of sulphur, it could be assumed that any germs absorbed from the air had been destroyed. It was then saturated with an 8 to 10 per cent. solution of chloride of zinc, and the excess of the solution removed by a press, somewhat like that used by bookbinders.¶ The tow was next dried, at ordinary temperature or at a moderate heat, being repeatedly turned over, and was after twenty-four hours sufficiently dry to permit being again carded. Finally, the material was formed into flat cakes of the size of plates, about $1\frac{1}{2}$ inch thick, and transferred to air-tight tin boxes, containing caustic lime, in order to prevent its decomposition by the carbonic acid of the air."

It was now of interest to ascertain, first, whether the process here described furnishes a completely aseptic dressing, and, secondly, whether the percentage of

* From *St. Petersburger Medic. Wochenschrift*, 1882, No. 50. Reprinted from *New Remedies*, April, 1883.

† We have uniformly translated the term "schiffswerg," which the author uses, with "tow," although he specifically states, in a subsequent portion of the paper, that it is prepared from old, condemned *tarred* ropes . . . which have probably lost a good deal of their tar by long exposure. This would, under ordinary circumstances, have to be rendered into English by "oakum;" but the article usually sold here under this name usually contains too much tar to readily absorb aqueous solutions. Tarry oakum is much used for dressing, particularly in this country; but the tow or oakum meant by the author is made from *old* tarred ropes, which have lost their stiffness. And it seems to us that plain tow, which has never been tarred, will answer the purpose even better.—*Ed. New Remedies.*

‡ Dr. Fischer 'Handbuch d. Verbandlehre,' 1878, p. 7.

§ *Centralblatt f. Chirurgie*, 188, No. 41.

‖ *St. Petersb. Med. Wochensch.*, 1881, No. 32.

¶ A common clothes-wringer is, in our experience, the best contrivance for such purposes.—*Ed. N. R.*

chloride of zinc contained therein was approximately uniform.

To decide the first-mentioned point, it seemed advisable to use a method already used by former investigators, as Pasteur, Cohn, etc., and lately, also, by Professor Frisch, of Vienna.* This consists in bringing the material to be examined for the presence of vital germs or surviving spores into a medium favourable for their development. But, as it has been shown by the experiments of Billroth,† Kuehn‡ and Boehlendorf,§ that different forms of bacteria do not develop and grow equally in all propagating media, it was necessary to use several of the latter. I selected four of them, namely, the following:—

a. Pasteur's propagating liquid, modified by Buchholz:‖ Sugar (candy), 100; nitrate of ammonium, 10; neutral phosphate of potassium, 5; distilled water, 1000 parts.

b. Cohn's propagating liquid, modified by Eidam:¶ Acid phosphate of potassium, 5; sulphate of magnesium, 5; neutral tartrate of ammonium, 10; chloride of calcium, 0·5; distilled water, 1000 parts.

c. Solution of extract of meat, containing 1 per cent. of the extract.

d. Normal urine.

The three first-mentioned liquids were first filtered, boiled from one-half to three-quarters of a hour, and the evaporated water replaced by addition of boiling distilled water. The urine was prepared for use by boiling for half an hour, then filtering, and again boiling the filtrate for half an hour, the lost water being replaced as in the other cases. The prepared liquids were transferred to propagating vessels, consisting of opodeldoc glasses (holding 1½ to 2 ounces), which were closed with tight plugs of cotton. Before the liquids were introduced, the vessels and plugs were heated during one hour to 180° to 200° C. (356°–392° F.), then allowed to cool sufficiently to permit the liquids being poured in, immediately stoppered and transferred to a hatching oven.** The temperature is in the oven varied from 36° to 38° C. (about 96°–101° F.). After the vials had been in the oven for a fortnight, it was found that, with the exception of a few, all of them had remained clear. The turbid ones were removed, and in each of the others 1 gram each of the samples of tow to be examined was introduced, great caution being used to rapidly open and close the vials. To obviate the objection that the mere lifting of the plug might have been sufficient to infect the contents, a few vials, in which the plug had been lifted in the same manner, but without any tow being introduced, were placed with the others in the oven. As criterion to pronounce upon the existence and development of germs in the several liquids, the appearance of a turbidity was relied upon.

Now, since crude tow (oakum) itself had already been in use for a long time as a dressing for wounds, it was of interest to find whether this alone, unprepared, fulfilled the requirements as an antiseptic dressing, although it could be presumed *d priori* that during its long exposure to all sorts of contaminating agents it had become infected.

Results with Unprepared Tow (Oakum).—All trials made with this showed that the tow contained living germs, which became more or less rapidly developed in the propagating fluids.

Results with Sulphurized Tow.—In this case the development of germs was slower than in the preceding cases. Yet after four days all propagating liquids were turbid. The tow had been kept for twenty-four hours exposed to the vapour of burning sulphur. This apparent inability of sulphurous acid gas completely to destroy the vitality of germs is also shown by a series of experiments lately made by the German Imperial Health Department. A better result was obtained by treating the tow with chlorine gas or chlorine water.

Results with Chlorinated Tow.—Tow which had been treated for twelve hours with chlorine gas, or been kept covered for half an hour with officinal chlorine water, then expressed and introduced into the propagating vessels, failed to show the development of any germs, even after standing for months.

Results with Chloride of Zinc Tow prepared by Cold Soaking.—Picked tow was completely saturated with a 10 per cent. solution of chloride of zinc, the excess of liquid pressed out between two small boards, and the tow dried at the ordinary in-door temperature. When completely dry, the tow was carded and then used. Two separate series of experiments were undertaken, each with twelve vials. In both series all the liquids developed fungi, etc., which covered, after three weeks, the whole surface of the liquid. The results showed that a simple treatment of the tow with a 10 per cent. solution of chloride of zinc was insufficient to destroy vital germs. Now, as it is known that the latter can be killed by a temperature of 100° C. (212° F.) and over, a new trial was made, in which the tow was boiled for half an hour in the 10 per cent. solution.

Results of Chloride of Zinc Tow prepared by Boiling.—Four separate series of experiments, each with twelve vials, furnished identical results. No development of fungi, etc., could be noticed in any of the liquids, even after standing for months. On repeating the experiment with a 5 per cent, solution of chloride of zinc, the same result was obtained.

The second point which I desired to determine was, whether the percentage of chloride of zinc in the finished dressing was approximately uniform. For this purpose, Balling's* volumetric method was used, which consists in determining the zinc by means of carbonate of sodium, with phenol-phthalein as an indicator.† I employed a solution of carbonate of sodium of such a strength that 1 cubic-centimetre corresponded to 0·0209 gram of chloride of zinc. The determination was made thus:—5 grams of the air-dry chloride of zinc tow were macerated with 100 c.c. of distilled water, for twenty-four hours, in a closed vessel, under repeated stirring; then 25 c.c. were measured off, diluted with 250 c.c. of boiling distilled water in a flask heated to boiling, a few drops of an alcoholic solution of phenol-phthalein poured in, and the volumetric solution of carbonate of sodium added, until the liquid assumed a distinct rose-colour. The following results were obtained:—

a. Tow, previously carded, boiled with a 10 per cent. solution of chloride of zinc, dried in a room, and then again carded, yielded, in an air-dry condition, 14·83 per cent. of chloride of zinc as a mean between 4 determinations. In another sample 14·58 per cent. were found.

b. Tow treated exactly like the preceding, but with a 5 per cent. solution only, yielded 8·85 (another sample 8·67) per cent. of chloride of zinc.

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* In his paper "Ueber die Desinfection von Seide und Schwämmen zu chirurgischen Zwecken," in *Archiv. f. Klin. Chir.*, vol. 24, 1879, p. 749.

† 'Untersuchungen über die Vegetationsformen der Coccobakterien,' Berlin, 1874, p. 58, 121.

‡ 'Ein Beitrag zur Biologie der Bacterien,' Dissert. Dorpat, 1879.

§ 'Ein Beitrag zur Biologie einiger Schizomyceten,' Dissert. Dorpat, 1880.

‖ *Arch. f. experim. Pathol. und Pharmakol.*, iv., 3.

¶ Cohn, 'Beiträge zur Biologie der Pflanzen,' i.

** For this purpose I used a double-walled box made of tinned iron, such as is used for the preparation of Lister's carbolic gauze, and has been described by me in a paper on the preparation of salicylated and benzoated dressings in the *Voyenno-Meditsink. Journ.*, 1880, July number. The box held 250 vials.

* *Chemiker-Zeitung* (1881), No. 23, p. 395.

† Before using the method, I convinced myself that an aqueous extract of crude oakum with carbonate of sodium yielded no precipitate, and that the solution was free from ammoniacal salts, since the presence of the latter, according to Balling, retards the appearance of the end-reaction.

c. Tow treated as under *a*, but dried at 60° to 70° C. (140° to 158° F.), and then carded, yielded, after one day's exposure to the air, 12·86 per cent. of soluble chloride of zinc.

d. Tow treated as under *c*, but prepared with a 5 per cent. solution, yielded 7·01 per cent. of chloride of zinc.

The preceding figures show that the dressings contain practically uniform quantities of the salt. The circumstance that tow soaked in a 10 per cent. solution of the salt retains more than 14 per cent. of the latter, is explained by the fact that it soaks up about one and a half times its weight of the solution. The quantity of the salt in the samples dried at 60° to 70° C. is smaller, which is partly due to the loss caused in the process of carding.

For the purpose of ascertaining the keeping qualities of the dry chloride of zinc tow, a new assay of the samples was made after six months.

a. Samples which had been carded and been kept loosely in filtering paper yielded 11·52 (or 10·33) per cent. $ZnCl_2$, while they had formerly contained 14·75 and 14·38 per cent., respectively.

b. Samples which had been kept, uncarded, in waxed paper, lost scarcely anything; those which originally contained 14·75 and 14·38 per cent. were found to assay 14·70 and 14·31 per cent.

Chloride of zinc tow, therefore, may be kept, practically unaltered, for a considerable time, if wrapped in waxed (or paraffined) paper.

On the basis of the results here described, I propose the following method for preparing this form of dressing, of a strength of about 15 per cent.:—

Preparation of Chloride of Zinc Tow.

Commercial, crude tow is thoroughly carded, then boiled for half an hour with ten or fifteen times its quantity of a 10 per cent. solution of chloride of zinc, in a kettle which can be closely covered. It is then pressed between two hinged boards, and dried in thin layers, at the ordinary in-door temperature. When dry, it is either at once carded, or it may be preserved uncarded in waxed paper.

If the tow is to contain 10 per cent, of chloride of zinc, a 7 per cent. solution of the dry salt is taken; and for a 5 per cent. dressing the strength of the solution is reduced to 3½ per cent.

When thus prepared, and particularly after being several times carded, the prepared tow is quite soft, and advantageously replaces salicylated cotton, owing to its cheapness.

I have also made some experiments to test the antiseptic properties of the dressing thus prepared, compared with those of salicylated cotton and jute. [The tables appended by the author must be omitted here, for want of room; the results are summarized as follows:] 3 grams of the respective kind of dressing were added, each, to 100 c.c. of fresh urine, in vials which were kept open, and at a temperature of 30° to 35° C. (86° to 95° F.). A sample of the urine alone became offensive after four days; two others treated with an 8·5 per cent. and a 14·6 per cent. chloride of zinc oakum, as well as one treated with a 10 per cent. salicylated cotton, were still clear and acid after six days; another containing some 4 per cent. salicylated cotton became turbid after three and offensive after six days; and one sample treated with some 4 per cent. salicylated jute (which had, however, been carelessly kept) became offensive after two days. In another series of experiments, 5 grams of the respective dressings were, each, added to 100 c.c. of already offensive and alkaline urine; the samples containing a 10 per cent. salicylated cotton, and that with an 8·5 per cent. chloride of zinc tow, though at first rendered neutral soon became offensive again; but the sample treated with a 14·6 per cent. chloride of zinc tow turned gradually clear and acid, and remained so at the end of the second day.

These results confirmed the decided antiseptic properties of chloride of zinc, already recognized by most surgeons.

Tow (or oakum) may also be impregnated with other antiseptics, such as carbolic, salicylic and boric acids, iodoform, etc., by slightly modifying the above process, as I have found by preliminary trials. Special directions for their preparation will be published at some future time.

TINCTURA FERRI CITRO-CHLORIDI.*

BY ARTHUR H. STILES.

This is an unofficial compound, to prepare which take of—

Citric acid	℥xviij.
Bicarbonate of sodium	℥xiv.
Solution of chloride of iron	℥xij.
Water	℥ij.
Alcohol sufficient to make	℥vj.

Heat the water to the boiling point and, having dissolved in it the citric acid, add the bicarbonate of sodium in successive portions, stirring after each addition until effervescence ceases; then add the solution of iron, stirring well, and afterwards, sufficient alcohol to make the mixture measure 6 fluid ounces; lastly filter the solution to remove any foreign matter that may be present, and keep it in well stopped bottles.

In my first experiment, having heated the water to the boiling point and dissolved the acid, I began adding the sodium salt, but, before one-half had been added the solution took the form of a crystalline mass very hard and but slightly soluble.

Thinking that the heat had, by its continued application, driven off a part of the water, in my next trial, after dissolving the acid in the heated water, I removed the solution to a mortar, then adding the bicarbonate of sodium, triturating after each addition. By so doing I obtained a solution of a syrupy consistence, having an acid taste and a very marked reaction on blue litmus, which is an acid citrate of sodium.

Then I added the solution of iron.

The reaction which occurs here is not so easily accounted for. That there is a reaction is very evident, for, before the alcohol is added, the solution obtained by the addition of the solution of iron to that of citrate of sodium is clear, but after it has been added a precipitate is thrown down, which has the appearance of, and answers the tests for chloride of sodium.

As it appears to me, the chloride of sodium is held in solution until the alcohol is added and then, owing to its comparative insolubility in the alcohol, the salt is thrown down as a precipitate.

I have since obtained the same result by reducing the acid to a powder, adding the sodium salt and water, setting the mixture aside until solution is complete, and then adding the other ingredients as before mentioned.

The completed solution is of an emerald green colour, having the specific gravity 1·200, and containing the same amount of solution of chloride of iron as did the tinctura ferri chloridi of the U.S. Pharmacopœia of 1870, and 1·22 parts less than that of 1880.

The advantages of this preparation are its miscibility without discoloration or formation of precipitates, with preparations of barks, all tonics and Fowler's solutions; it has an agreeable taste, that of iron being almost obliterated, and it has no injurious effect on the teeth.

Its medical properties are identical with those of tinctura ferri chloridi. The dose is from 10 to 30 drops.

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* From a thesis presented to the College of Pharmacy of the City of New York, March, 1883. Reprinted from *New Remedies*, April. 1883.

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ENERGY AND ITS TRANSMISSION.

THE enormous progress made in the science of electricity during the last few years has attracted so much attention to this form of energy and the available means of transmitting it from one place to another, that there has been a tendency to lose sight of other sources of energy and means of transmission which, though more old-fashioned, are scarcely, if at all, less valuable. Professor OSBORNE REYNOLDS has therefore done useful and timely service in giving a little more prominence to this latter part of the general subject in his recent "CANTOR" course of lectures on "The Transmission of Energy," delivered before the Society of Arts.

Energy is, as a rule, only useful to man to the extent that it can be controlled and directed, but, as pointed out by Professor REYNOLDS, it exists to a great extent in an "undirected" condition, although by various devices it is possible to bring it largely under control. "Undirected" energy may be considered to be analogous to an undisciplined mob, which can be directed as a whole only by directing each of its separate constituents. In the case of a mob this can sometimes be accomplished, but in the case of energy, where the constituents are molecules of matter, it cannot in practice be effected. "Directed" energy is more analogous to a trained army, although it may be disciplined only to an extent sufficient to execute one manœuvre with full effect, and if compelled to execute other manœuvres would not carry them out to the fullest advantage. An illustration of this may be found in coal, the total "undirected" energy stored up in one pound of which is estimated to amount to ten to twelve million foot-pounds. Of this quantity it is possible to convert seven to nine million foot-pounds into "directed" energy; but in utilizing this energy in the steam-engine, a great loss is sustained in its passage through the plate of the boiler, and only about one-third, or from two to three million foot-pounds of "directed" energy, enters the boiler. A further loss is sustained in the transmission of this energy from the boiler to the piston, and in some cases only half a million out of the original ten or twelve million foot-pounds reach the piston as "directed" energy, whilst in the highest class of engines yet constructed, the quantity only reaches one and a half million foot-pounds. Thus it will be seen that if steam-engines should be eventually perfected so as to throw upon the piston the whole of the energy which enters the boiler, this will amount to only about one-fourth of the energy stored up in the coal.

In view of the possible eventual scarcity of coal, consequent upon the enormous demand for it as a convenient source of energy, attention has been turned in other directions. The winds have been captured and made to do service to man, and the waters have been intercepted on their way to a lower level and made to pay a toll of work. An enormous store of energy resides also in the waves of the sea, which at the present time are apparently doing no other work than gradually washing away our coasts. It has been already shown, however, that a ship may be propelled by the rocking of the waves on which it floats, and it is probable that before long the ingenuity of man will devise means for extorting a tribute from the ocean. Another source of energy mentioned by the lecturer is the oxidation of organic matter, as in the case of a draught animal fed upon corn. But if corn be used as fodder for horses, instead of coal being used for the production of steam, the cost is ten times as great to produce the same amount of energy. Accordingly, to be equally profitable, the energy obtained from a horse should be ten times as valuable as the same amount of steam-energy, and this, for certain purposes, is true, for although in some cases steam-power can be used equally as well as horse-power, yet in others, in which the energy is required to be brought in closer connection with the work, horse-power has a considerable advantage. With respect to inorganic matter, if we may judge from the enormous amount of energy expended in dissociating the oxides of metals, amounting, in the case of iron and zinc, to nearly two million foot-pounds per pound of metal, if it were possible to apply the energy of such oxidation the metals would become rivals to coal.

The distance through which energy is capable of being transmitted varies according to the medium of transmission. Thus if transmitted by water only about one part in one hundred and twenty thousand of the energy will be lost per mile, whilst if transmitted by railroad the loss will equal one part in twelve thousand; stated roughly, an amount of energy that can be transmitted by canal 120,000 miles would only pass over a railroad 12,000 miles, over a good ordinary road 1000 miles, and without a road 300 miles. There are several artificial methods of transmitting energy: (1) It may be contained in a medium which may itself be carried from place to place as in a watch; (2) By means of shafts; (3) By means of the flow of heat or electricity along material conductors. Although radiation is used both in optics and acoustics, the only example of its use in the transmission of energy is the radiation of coal through a boiler-plate.

Power stored in one form is much more available than power stored in another, and the weight of material required in each form to enable a certain amount of energy to be stored in it varies also. Thus, to store one million foot-pounds in a steel spring involves the use of material weighing about three hundred thousand pounds; compressed air in pipes, representing the same amount, would require seventy-five to two hundred pounds, water compressed in pipes fifty to one hundred and fifty pounds, FAURE'S battery about seventy pounds, a locomotive (with coal and water) about fifty pounds, a horse about two hundred pounds, and coal about one and a half pounds. The relative cost is also to be considered, and taking coal as the standard, the methods of compressed air in pipes and FAURE'S battery are, roughly speaking, three times as costly.

Another point to be considered is that not only power is required, but applied power; the relative capabilities of different methods for the mechanical transmission of one thousand horse-power is indicated by the following table:—

Means.	Diameter (in inches).	Loss (per mile per cent.).	Practical limit (in miles).
Shafts	4	10	7
Steel ropes (single)	·75	·5	100
Steel ropes (double)	1	1·5	33
Compressed air in pipes	30	—	100
Water compressed in pipes	12	10	7

With regard to the foregoing it may be remarked that a 4-inch shaft will not practically transmit more than 75,000 foot-pounds per second. The great advantages of a steel rope are apparent, but the compulsory use of double steel ropes in most cases tends to lower the figures considerably, and it has been found that they are practically of no use to transmit less than forty or fifty horse-power. Like steel ropes, water is most effective when used in transmitting high pressures, its great disadvantage being due to leakage; but if the diameter of the twelve-inch pipe were doubled, that is to say, if the capacity and cost were quadrupled, instead of the practical limit being seven miles it would be over two hundred. The transmission of energy by means of air compressed in pipes involves no appreciable loss from friction, and unlike other methods this will transmit high or low pressures equally well. DEPREZ has made several experiments on the transmission of energy for long distances by electricity, but although the results look well, the lecturer was of opinion that if reduced to the same standard as that of steel ropes, they would be seen to be really small. It may be remarked, however, that at the end of the course of lectures, the Chairman expressed an opinion that DEPREZ had made his experiments at a disadvantage, and moreover, Sir WILLIAM SIEMENS has recently given his reason for believing that much better results can be obtained by this method.

The second reading of the Medical Acts Amendment Bill has been again adjourned until Monday next. When speaking on Tuesday evening of the Government measures that it is intended to push through Parliament this session, the Prime Minister made no reference to this Bill, so that it is possibly looked upon as one of the "measures of secondary importance," concerning which, he said, doubts might arise as to persevering with them.

* * *

Petitions have already been presented in the House of Commons for the amendment of the Medical Bill, on behalf of the King and Queen's College of Physicians, Ireland, and the Society of Apothecaries, London. The former body asks that it may be placed on an equal footing with other medical authorities by being empowered to return three, instead of two, representatives to the proposed Medical Board for Ireland. The latter body asks for the restoration of the provision originally contained in the Bill, under which it would have chosen one of the fifteen members of the Medical Board for England.

* * *

In the petition from the Society of Apothecaries it is urged, among other pleas, that the large majority of country practitioners obtain their medical diplomas from that Society, and that it is peculiarly connected with what are called general practitioners, who form a very numerous and influential body, and who for the most part supply their own medicines and thereby satisfy a great public want.

* * *

According to the *British Medical Journal* a subcommittee appointed by the Council of the Metropolitan Counties of the British Medical Association has also decided to attempt to secure the introduction of several amendments into the Bill. One of these is to alter the fourth division of clause 27 so as to absolutely prohibit unregistered persons from practising medicine in any of its branches for gain.

* * *

At a meeting of the chemists of Rochdale, held last week, it was resolved to forward a petition to the House of Commons, praying for a clause to be inserted in the Medical Act Amendment Bill, for the purpose of placing pharmaceutical chemists on the Committee for the compiling and revision of the Pharmacopœia.

* * *

A correspondent of the *British Medical Journal* expresses an opinion that the present time, when Bills are under consideration for the amendment of both the Medical and the Pharmacy Acts, would be opportune for an endeavour to prevent druggists from prescribing medicines, of the physiological and therapeutics of which, he says, they know little or nothing. To effect this he proposes that a clause should be inserted in the Pharmacy Bill enacting that scheduled "poisons" are only to be prescribed by a legally qualified man, who shall affix his name and address to all prescriptions ordering them, without which it shall be unlawful for them to be dispensed by a pharmacist. He would also compel a pharmacist to cancel a prescription ordering a poison by writing his name upon it and make it unlawful to repeat a prescription so cancelled without the prescriber's authority. These restrictions he would also impose upon medical men keeping open shop for the dispensing of other practitioners' prescriptions.

The same gentleman expresses his sympathy with chemists and druggists in their "attempts to get the monopoly of selling and compounding all—with a few exceptions—the medicines enumerated in the British Pharmacopœia," and he thinks that such a concession would be a graceful act and only fair to them after the prolonged study and expense to which they have been put to qualify themselves. To prevent, therefore, the sale of articles used in medicine by incompetent persons he suggests that, with the exception of a few scheduled articles to be kept by the grocer and the drysalter, the dealing in all medicines should be restricted to legally qualified druggists. This correspondent does not say whether, having provided for the protection of the medical profession in the Pharmacy Bill, he would secure the interests of chemists and druggists in the Medical Bill; neither does he say how far he thinks the probability of the passage of either Bill would be affected by such a course.

* * *

A case recorded in the *British Medical Journal* last week well illustrates the perverse carelessness which is beyond the power of any poison regulations to control. A woman in a small village in the west of Ireland, finding some whitish powder in a dirty kind of trough that had been left by a previous tenant, came to the conclusion that it must be "bread-soda," and used it in the making of a cake. The result was that within an hour of partaking of the cake the whole family showed symptoms of poisoning and her husband died the next day. The "bread-soda" turned out to be arsenious acid, the residue from a batch of sheep-dressing.

* * *

A case of poisoning by butter of antimony is reported in the last number of the *Lancet*, in which death followed within two hours of swallowing the poison. The poison had been purchased a twelvemonth previously for the treatment of sheep suffering from foot-root; and the portion unused, after being carried about from place to place, appears to have fallen into the hands of the farmer's wife, who was of unsound mind. Mr. Cooke, who reports the case, appears to think that butter of antimony should be included in the first part of the poison schedule, since although in this case the bottle was labelled "poison," and with the name and address of the seller, he remarks that the now prevalent use of this substance by farmers for foot-rot may lead to more frequent cases of poisoning unless its sale be placed under more stringent regulations. He is evidently unaware that the Privy Council has recently refused to sanction its introduction into the second part of the schedule.

* * *

The medical practitioners of Illinois appear to be endeavouring to obtain an amendment of the recently passed pharmacy law of that State, so as to make it compulsory for the pharmacy board to accept medical graduates as duly qualified pharmacists without examination. The editor of the *Pharmacist* has naturally taken umbrage at this claim, and in order to illustrate the danger to the public of allowing physicians to take the place of pharmacists, tells a story sufficient to prove his case—and more! He states that a medical man, whose name is given, went to a grocery store with a patient and asked for an ounce of acetate of potash. The boy in charge, before serving him, explained that the "acetate of potash" in stock had nearly killed a man the week before, but the doctor after examining the substance in the jar pronounced it all right. The following conclusion to the story is the editor's own, italics and all. "*That jar was filled with prussiate of potash*, a deadly poison. The doctor then gave Mr. Swift one ounce of the poison—enough to kill ninety-six adults—and Mr. Swift died from its effects."

* * *

The last volunteer report on the London water supply, put forward on behalf of the Water Companies, shows that the recently expressed opinion of the President of the Local Government Board (see before p. 863) has not been without effect, since it does not purport to be addressed to that official, but is "submitted for the information of the Local Government Board." But it cannot be said that a submissive spirit pervades the report, for the writers express an opinion that "in the reports made to the Registrar general [*i.e.* the official reports], which not merely set forth the bare analytical results obtained, but profess to explain their import and signification, some statement as to the precise nature of what are so vaguely designated 'moving organisms,' and some information of their real importance, might in common fairness be expected from one who, by his persistent use of language which has been reprobated by a Royal Commission, does not a little to create an unfounded prejudice against the water supply on which he is expected impartially to report." *Tantœne animis cœlestibus iræ?*

* * *

The *Pharmaceutical Record* mentions that up to the 1st of May, the examinations for the degree of "graduate in pharmacy" at the different colleges of pharmacy in the United States had been attended by 469 students, of whom 388 had passed. This completes the record for the last session, with the exception of one college.

* * *

A course of botanical lectures and demonstrations has been commenced by Mr. J. G. Baker, F.R.S., at the Garden of the Apothecaries' Society, at Chelsea, and will be continued on successive Saturdays during the summer months. At the first lecture the room was completely filled, Mr. Baker's well-known ability as a lucid lecturer attracting large numbers. Admission to the lectures is obtained by application to the Beadle of the Society at Blackfriars.

* * *

On Monday evening next, June 4, at 8 o'clock, a meeting of the London Section of the Society of Chemical Industry will be held in the Chemical Society's rooms, Burlington House, when Mr. G. W. Wigner will read a paper on "The Packing of Goods of Delicate Odour, such as Tea, etc.;" and a communication will be read from Mr. G. Ward, "On the Salt Deposits of the Cleveland District."

* * *

A meeting of the School of Pharmacy Students' Association will be held on Thursday, June 7, at 8 p.m., when a paper will be read by Mr. C. Ranken, on "Some Old and New Theories concerning the Vegetable Cell." A Report upon Materia Medica will be made by Mr. W. Elborne on the subject of "Commercial Rhubarbs."

Pharmaceutical Society of Ireland.

SPECIAL MEETING OF THE COUNCIL.

Tuesday, May 15, 1883.

Present—Profcssor Tichborne, President; Dr. Collins, Dr. Montgomery, Messrs. Allen, Brunker, Draper, Hayes, Payne (Belfast) and Wells.

The Registrar (Mr. Fennell) read the following letter and petition:—

"Privy Council Office,
"*May 3rd*, 1883.

"Sir,—I am directed to transmit to you herewith, a copy of a petition which has been presented to the Lord Lieutenant in Council by Mr. John P. Middleton, appealing against the refusal of the Council of the Pharmaceutical Society of Ireland to admit him to the examination for their licence, and I am to request that you will move the Council of the Society to favour me, for His Excellency's information, with any observations they may desire to offer thereon.

"I am, Sir,
"Your obedient servant,
"W. S. B. Kaye.

"The Registrar,
"Pharmaceutical Society of Ireland,
"Kildare Street."

"*Petition.*

"To His Excellency the Right Honourable John Poyntz, Earl Spencer, K.G., Lord Lieutenant of Ireland in Council.

"My Lord,
"May it please your Excellency,

"The petition of the undersigned humbly showeth that whereas the 'Pharmacy Act (Ireland), 1875,' section 22, enacts that the Council of the Pharmaceutical Society 'shall cause examinations to be held at such times and in such manner as may be prescribed by regulations made in pursuance of this Act,' and that 'all persons desirous of being registered as pharmaceutical chemists under this Act, may, at any such examination, present themselves for examination, and shall be examined with respect to their knowledge of the Latin and English languages, of arithmetic, of botany, of materia medica, of pharmaceutical and general chemistry, of practical pharmacy of the British Pharmacopœia, and of such other subjects as may, from time to time, be prescribed by any regulations made in pursuance of this Act.'

"That it is my desire to present myself for examination.

"That regulations made under the sanction of your Council are placed as a bar to my examination under circumstances as set forth in accompanying declaration and correspondence, of great injustice to me.

"That Mr. George H. Grindley was admitted a licentiate of the Pharmaceutical Society in July, 1876; was elected a member in September of the same year; commenced the business of pharmaceutical chemist in 1876 in partnership under the style of Brooks and Co., Pharmaceutical Chemists, at 136, Lower Baggot Street; was elected member of the Council in October, 1880; and kept open shop for the firm until October, 1882.

"That he received me as apprentice to the business of pharmaceutical chemist in 1877, and retained me as such apprentice till the full term of five years' apprenticeship ended in June, 1882.

"That during said apprenticeship, with his knowledge and approval, I presented myself for examination in respect of my knowledge in the Latin and English languages, of arithmetic, of botany and general chemistry, and hold their certificate of having passed the Preliminary examination of the Pharmaceutical Society of Ireland, dated October, 1879.

"That the correspondence annexed showeth that the Council refuse to admit me to examination for their licence because 'Mr. Grindley was associated with an unqualified partner in business,' although his certificate sets forth he was the managing partner, and had the business in his sole control.

"I respectfully submit that I am thereby dealt with unjustly, and appeal for such review and redress as your Excellency in Council may be able to afford; in support of which I claim that Mr. Grindley was 'keeping open shop' in the terms and meaning of the regulation on page 35 of the Society's Calendar, 1883, and that said regulation is itself opposed to the plain reading of section 22 of the Act of Parliament.

"And your petitioner will ever pray.

(Signed) "John P. Middleton,
"11, Hardwicke Street, Dublin.

"*April 26th*, 1883."

The Registrar read the Report of the Certificate Committee on this matter. (See *Pharmaceutical Journal*, April 14, 1883, p. 844.) Also the following query, addressed in August, 1878, to Mr. T. A. Purcell, Q.C., and his opinion thereon.

Query:—"Is it legal for a firm, consisting of two or more members, of whom only one is a qualified apothecary or pharmaceutical chemist, to compound poisons or medical prescriptions, or to sell poisons by retail, for the mutual benefit of all the partners? This question is intended to include co-operative and limited liability companies and societies of which a small number of the members or partners are qualified apothecaries or pharmaceutical chemists."

Opinion:—"In my opinion it is not. The Act makes it unlawful for any unqualified person not only to sell, but also to keep open shop, for the retailing, dispensing, or compounding of poisons or medical prescriptions, and it does not cease to be unlawful for such unqualified persons to sell or keep open shop, because other persons, connected with them as partners, may be qualified to do so.—T. A. Purcell."

Proposed by Mr. Brunker, seconded by Mr. Allen, and resolved:—

"That the Registrar be directed to draw up a reply to the Clerk to the Privy Council stating the circumstances under which the certificate presented by Mr. Middleton was rejected, and to state that the Council were guided in the course which they adopted by the opinion of Mr. Purcell, Q.C., a copy of which is to be enclosed to the Privy Council."

The meeting then broke up.

Provincial Transactions.

GLASGOW CHEMISTS AND DRUGGISTS' ASSOCIATION.

The annual general meeting of this Association was held on Tuesday evening, May 22, Mr. R. Brodie, Vice-President, in the chair.

The minutes of the previous meeting having been read and approved of, the annual reports by the Secretary, Treasurer and Librarian were adopted.

The President then intimated that a communication had been received from the General Medical Council, inviting suggestions regarding the proposed new edition of the British Pharmacopœia.

After consideration, it was, on the motion of Mr. Joseph A. Clarke, remitted to the Council of the Association to consider the matter.

The following office-bearers were then elected for session 1882–83:—President, Mr. John McMillan; Vice-President, Mr. R. Brodie; Secretary, Mr. John M. Arnot; Treasurer, Mr. John Walker; Librarian, Mr. T. W. J. Law; Councillors, Messrs. J. A. Clarke, John Currie, James Dickie, Daniel Frazer, J. L. Hatrick, J. C. Hunter,

A. Kinninmont, David Lees, R. McAdam, William Maltman, R. Craig Rait and William Simpson; Auditors, Messrs. A. Paterson and W. Paris.

This being all the business, the meeting afterwards broke up.

LEICESTER CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

A lecture was delivered at the rooms of the above Association on Wednesday evening, May 23, by Mr. W. B. Clark on "Ferrum." Mr. J. Garrett presided.

The lecturer explained the chief sources of the iron found in commerce, the methods of separating it from the ore, and the preparation of cast and wrought iron, and steel. He also dealt with the chemistry of iron, specially with the different preparations of it in the B.P.

Throughout the lecturer was listened to with marked interest.

Mr. Garrett proposed a vote of thanks to Mr. Clark for his instructive lecture, which was seconded by Mr. Edwards and carried.

NOTTINGHAM AND NOTTS CHEMISTS' ASSOCIATION.

The annual meeting of the above Association was held at The George Hotel, on Tuesday, May 29, the President, Mr. R. Fitzhugh, F.C.S., in the chair.

The minutes of the previous meeting having been read, the President called upon the Hon. Secretary to read the Annual Report.

The Report commenced by congratulating the members upon the present satisfactory state of the Association. Although the personal interest taken in the work and the attendance of members at its monthly meetings are not what could be desired, the Council feels that good and useful work has been done during the past session. The society at present numbers 52 members and 21 associates (total, 73), as against 52 members and 26 associates (total, 78) last year, showing a decrease of five associates. During the year two new members and three associates have been elected. The Treasurer's account for the past session shows a balance of £70 7*s.* 10½*d.* as against last year of £52 15*s.* 10*d.*, or an increase of £17 12*s.* 0½*d.*; and the Council suggested that the forthcoming executive should, if possible, reduce the above balance, by endeavouring to obtain suitable rooms for the library and museum, and in making additions to the library, so that the Association may become of more value to our young men. During the session six meetings have been held, the average attendance having been fairly kept up. At the social meeting, held on December 19th, Mr. W. H. Parker opened a discussion upon "The present numerous Violations of the Pharmacy Act existing in Nottingham," and after an animated discussion a sub-committee was duly appointed to consider the question. This committee reported that it had gathered the necessary information and had brought the matter under the notice of the proper authorities, and it was of opinion that the time had arrived when some definite and persistent action should be taken against unqualified men, and the large amount of illicit trading going on. It recommended to the Council and Association that a law committee be appointed every year at the annual meeting. The lectures given by Mr. Spencer and Mr. Major had been most valuable, and thoroughly appreciated by the members and associates, and the Council feel that the thanks of the Association are due to those gentlemen. The annual supper had been as usual a marked success, over sixty members and friends being present. After the supper Mr. Holgate again introduced the subject of the Pharmaceutical Benevolent Fund, and a collection was made, when the sum of five guineas was subscribed, which had been left in the President's hands to distribute in votes on behalf the Association. During the session it had been felt by several members of the Association that he time had come when some recognition should be made to the President for his valuable services rendered to the Association since its foundation. Accordingly the Council took the matter up, and the appeal made had been most liberally responded to by the members. At the commencement of the session the executive had arranged with Professor Blake for a course of lectures upon botany, to be given at the University College, at reduced fees, to the students; but owing either to the apathy of the students, or to the time arranged being inconvenient for masters to spare their young men, only seven entered the class. A hope was expressed that this would be remedied in future sessions, as it would be impossible for the executive to organize classes for so small a number. At the present time the Council is taking steps with a view to the formation of a class during the next session at the University College, and will endeavour to make the time and fees within the reach of all students. The library contains 87 books, all in good condition. The issues have been 17 against 10 last year. The Council hopes the day is not far distant when more suitable rooms can be found, and the number of books materially increased, as it is felt the present arrangement is only a temporary one. In concluding the report, mention is made of the retirement of an old and valued member of the Council, Mr. Robert Jackson, who for five years filled the post of Honorary Secretary with great energy and zeal.

A discussion took place upon the above report, in which it was suggested the large balance in hand should be used in part by furnishing the Library with some standard medical works for the use of the members. This was decided to be discussed at the next Council Meeting, and the report was unanimously adopted.

The Treasurer's report was next presented, having been duly found correct by the Auditors, Messrs W. W. Widdowson and W. Smith, showing a balance in hand of £70 7*s.* 10½*d.*, and on the motion of Mr. Fitzhugh, seconded by Mr. Jackson, was passed.

The following Officers and Council were elected for the ensuing year. President, Mr. R. Fitzhugh, F.C.S.; Vice-President, Mr. J. Wilford; Treasurer, Mr. W. H. Parker; Honorary Secretary, Mr. C. A. Bolton. Council:—Messrs. F. White, M. H. Humphreys, T. B. Fletcher, C. W. Warriner, S. V. Holgate, J. Lewis, W. Oldershaw, and A. Smith.

During the evening, the following members and associates were admitted:—Messrs. Gill, Bull, and Rowe.

A vote of thanks, proposed by Mr. Fitzhugh, seconded by Mr. Jackson, and supported by Mr. Parker and Mr. White, was accorded to the Honorary Secretary, Mr. C. W. Warriner, upon his retirement from that office, after having held it three years.

The meeting was brought to a conclusion with the usual vote of thanks to the President for his services during the past year.

Proceedings of Scientific Societies.

SOCIETY OF CHEMICAL INDUSTRY.

Chemistry and Analytical Examination of Fixed Oils.*

BY ALFRED H. ALLEN.

It is a significant fact that the technical examination of oils was, until very recently, usually limited to the application of a few rough tests of a very unsatisfactory kind, the assay being commonly conducted by the oil merchant, drysalter, or engineer. That this state of things should exist is doubtless due in a great measure to the difficulties attending a more complete examination, but still more is it owing to the general indifference of chemists on the subject of oils, which indifference has necessarily reacted and prevented their services from being sought. That there are signs of a better

* Paper read before the London Section of the Society.

condition of things I think is certain, but the fixed oils, as a class, are still regarded with a kind of horror by many able chemists, and their chemistry is, I fear, considered eminently uninteresting. That there should be a feeling of this kind with respect to a class of bodies not readily yielding crystallizable or coloured products, and of indefinite chemical composition, is very excusable, but it is to be feared that the limited interest taken by the great majority of chemists in the history of the fixed oils is the main reason why we know so little of them, and so many really interesting problems relating to them still remain as far from solution as when the matter was examined by Chevreul more than half a century ago.

The natural fixed oils may be conveniently described as ethers of higher fatty acids, occurring naturally in certain parts of animals and vegetables. Thus defined, the waxes are included under fixed oils, and although they present a marked difference in constitution from the majority of fixed oils, it will be seen afterwards that any sharper definition of the latter would introduce difficulties. Under the general term of fixed oils I include those members of the group which, like tallow and palm oil, are solid at the ordinary temperature. In a molten state the fats are true fixed oils.

It is well known that when treated with a strong base, or subjected to the action of superheated steam, the fixed oils are decomposed, in the same manner as artificial ethers, into an alcohol, and one or more fatty acids, which latter are obtained in a free state if steam be the agent employed, but in the form of a soap or salt of the fatty acid if a metallic base be used for the decomposition. On treating the resultant soap with a strong acid the fatty acids are set free.

The nature of the fatty acids obtained varies with the kind of oil operated on, but the following list of fatty acids obtainable by the saponification of natural fixed oils shows that the variety is much greater than is commonly imagined.

Name of Acids.	Formula.	Chief mode of occurrence.
1. Formic . . .	CH_2O_2	Butter fat. (?)
2. Acetic . . .	$C_2H_4O_2$	Butter fat.
4. Butyric . . .	$C_4H_8O_2$	Butter fat.
5. Valeric . . .	$C_5H_{10}O_2$	Whale oil.
6. Caproic . . .	$C_6H_{12}O_2$	Cocoanut oil, butter fat.
8. Caprylic . . .	$C_8H_{16}O_2$	Cocoanut oil, butter fat.
10. Capric or Rutic	$C_{10}H_{20}O_2$	Cocoanut oil, butter fat.
12. Lauric . . .	$C_{12}H_{24}O_2$	Cocoanut oil, spermaceti, fat of the bay-tree, pichurum beans.
14. Myristic . .	$C_{14}H_{28}O_2$	Cocoanut oil, spermaceti, nutmeg-butter.
16. Palmitic . .	$C_{16}H_{32}O_2$	Most natural fats, notably palm oil, spermaceti, and becswax.
18. Stearic . . .	$C_{18}H_{36}O_2$	Most animal fats, and in some of vegetable origin.
20. Arachidic . .	$C_{20}H_{40}O_2$	Arachis, or earthnut oil.
22. Behenic . . .	$C_{22}H_{44}O_2$	Oil of ben.
25. Hyænic . . .	$C_{25}H_{50}O_2$	Glandular pouches of the striped hyæna.
27. Cerotic . . .	$C_{27}H_{54}O_2$	Becswax, Chinese wax.

The acids in the foregoing list all belong to what is known to chemists as the acetic or stearic series, but, besides these, the following fatty acids of other series are important constituents of certain natural fixed oils.

Name of Acids.	Formula.	Chief mode of occurrence.
Hypogœic . . .	$C_{16}H_{30}O_2$	Earthnut oil (oil of arachis-hypogœa); said to exist also in sperm oil.
Oleic	$C_{18}H_{34}O_2$	Most animal fats, and non-drying vegetable oils.
Döglic acid . . .	$C_{19}H_{36}O_2$	As an ether in bottle-nose oil.
Brassic, or Erucic .	$C_{22}H_{42}O_2$	Rape, mustard, and other oils from the Cruciferæ.

In addition to these, ricinoleic acid, $C_{18}H_{34}O_3$, is the chief product of the saponification of castor oil, while linoleic acid, $C_{16}H_{28}O_2$, exists in linseed and probably in other drying oils. It is a curious fact that the great majority of the acids obtained by the saponification of natural fats contain an even number of atoms of carbon.

By far the most important and widely distributed of the acids of oils are the three which are obtained by the saponification of common lard and tallow. These are palmitic acid, $C_{16}H_{32}O_2$, stearic acid, $C_{18}H_{36}O_2$, and oleic acid, $C_{18}H_{34}O_2$. These three, with the linoleic acid of the drying vegetable oils, may be said to be the main products of the saponification of oils and fats.

In the great majority of fixed oils, the foregoing acids exist as "glycerides," or saturated ethers of the triad radical glycyl, C_3H_5. Thus the triolein, which constitutes the greater part of olive, almond, and lard oils, is the trioleate of glycyl.

$$\left.\begin{matrix}(C_3H_5)'''\\(C_{18}H_{33}O)_3\end{matrix}\right\}O_3$$

On saponification the fat undergoes hydrolysis, thus:—

$$C_3H_5.O_3.(C_{18}H_{33}O)_3 + 3H_2O =$$
$$3(C_{18}H_{33}O.OH) + C_3H_5.(OH)_3$$

Hence the glycyl trihydrate, commonly known as glycerin, but called by the Publication Committee of the Chemical Society *glycerol*, is the second product of the saponification of fixed oils.

In consequence of the similarity in the constitution of the various fixed oils, and the very nearly identical ultimate constitution of their leading proximate constituents, the majority of these yield nearly identical percentages of fatty acids and glycerin on saponification. Thus the following table shows the theoretical composition and products of saponification of the leading constituents of oils:—

	Empirical Formula.	Molecular Weight.	Products of saponification of 100 parts.	
			Fatty Acid.	Glycerin.
Glycyl tripalmitate (tripalmitin) . .	$C_{51}H_{98}O_6$	806	95·28	10·74
Glycyl tristearate (tristearin) . .	$C_{57}H_{110}O_6$	890	95·73	10·34
Glycyl triolcate (triolcin) . . .	$C_{57}H_{104}O_6$	884	95·70	10·40
Glycyl trilinoleate .	$C_{57}H_{86}O_6$	794	95·21	11·58

The waxes, on the other hand, are not ethers of glycyl, but ethers of some of the higher homologues of ethyl. Accordingly they yield a much lower percentage of fatty acids when saponified, and give in place of glycerin, solid monatomic alcohols. It is evident from these considerations that the study of the product of saponification may be of essential service in the examination of those oils which do not come under the general rule of yielding from 95 to 96 per cent. of fatty acids. Again, the acids being separated, much information can be gained from a study of their melting points and combining weights. The latter method of examination was first employed by Kœttstorfer, but he makes no attempt to isolate the fatty acids, but deduces the combining weight from the amount of alkali required for the saponification of the oil. This is effected by boiling the oil with a known quantity of a standard solution of caustic potash in alcohol, and when the saponification is complete adding a few drops of a solution of phenol-phthalein, and titrating back with standard hydrochloric acid. Manifestly the alkali which has disappeared is that which has combined with the fatty acids of the oil. Each cubic centimetre of half normal caustic alkali thus utilized represents ·02805 grams of KHO, whence the saturation-equivalent of the fat can be ascertained by the following formula, in which W is the weight of oil taken, and N the number of cubic centimetres of half normal alkali taken up by the fatty acids.

$$\frac{2W}{N} = \text{saturation-equivalent.}$$

In the great majority of cases this saturation-equivalent will be one third of the mean of the molecular weights of the constituents of the oil examined.

The following table shows the milligrammes of caustic potash required by one gram of various oils, and the saturation-equivalents calculated therefrom by dividing the former number into 56,100.

	Oil.	Grams of KHO required for 1000 grams of oil.		Average saturation-equivalent of oil.
A.	Tripalmitin	208·8		268·67
	Tristearin	189·1		296·67
	Triolein	190·4		294·67
	Tributyrin	557·3		100·67
B.	Butter fat	221·5 to 233·4		247·1
	Cocoanut and palm oils	270 „ 275		205·0
C.	Dripping	197 „ 196·5		285·1
	Lard	195·8 „ 195·4		286·8
	Tallow	196·8		285·1
	Horse oil	199·4		281·0
D.	Lard oil	191 „ 196		
	Olive oil	191 „ 196		
	Niger-seed oil	189 „ 191	189	
	Cotton-seed oil	191 „ 196·5	to	296·8 to 286 7
	Linseed oil	189 „ 195	196	
	Whale oil	190 „ 191		
	Seal oil	191 „ 196		
E.	Colza and rape oils	175 „ 179		
	Codfish oil	182 „ 187	175	
	Pilchard oil	186 „ 187·5	to	320·6 to 296·8
	Castor oil	176 „ 178	189	
F.	Sperm oil	130 „ 134·4		417 to 425·0
	Bottle-nose oil	184·2		304·5
	Shark oil	84·5		

The figures referring to the pure fats in class A are calculated, but all the others are the results of experiments made by Kœttstorfer, F. W. and A. F. Stoddart, L. Archbutt, or myself.

In the first place, it will be observed that, while dripping, lard and tallow have saturation-equivalents such as might be predicated from their known composition as mixtures of palmitin, stearin and olein, butter fat requires a much larger proportion of alkali for its saponification. This peculiarity is of course due to the fact that butter fat contains a notable proportion of tributyrin and glycerides of other of the lower fatty acids.* As a consequence, although it agrees with other animal fats in yielding about 95 per cent. of fatty acids, only about 87 to 88 per cent. consists of oleic and palmitic acids, the remaining being butyric acid and other acids more or less soluble in water. This peculiarity is now utilized by public analysts, at the suggestion of Messrs. Angell and Hehner, to distinguish real butter fat from "butterine" and other butter substitutes prepared from the more fusible portions of the fat of oxen, sheep, swine and other animals. The only fats which would give results on analysis at all comparable with those yielded by butter are the oils from the palm-nut and cocoa-nut,† and practical difficulties have hitherto prevented the complete success of this scientific sophistication.

(*To be continued.*)

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of this Association was held on Thursday, May 24, Mr. W. E. Crow in the chair.

Mr. E. E. Sewell read a paper entitled "Notes on some Abnormal Flowers," which will be published in a future number of this Journal.

In the discussion that followed, the Chairman, Secretary, Dr. Senier, Messrs. Baily, Dymond, Ranken and Ransom took part, after which a vote of thanks was passed to Mr. Sewell.

The Secretary (Mr. Dunstan) then made a Report upon Organic Chemistry, dealing with the "Chemistry of Mel Boracis." This paper also will be published in a future number of this Journal.

A discussion followed the reading of the Report, in which the Chairman, Dr. Senier, Messrs. Baily, Barnes, Carne, Dymond, MacDermott, Ranken, Ransom and Taylor took part.

The meeting then adjourned.

Parliamentary and Law Proceedings.

Prosecutions under the Patent Medicines Act.

At the Manchester City Police Court, on May 23, Mrs. Alice Lawton, chemist and druggist, Moss Lane, Hulme, was charged with selling patent medicines, without proper Government stamps on, and in this manner evading the patent medicine duty. Mr. Alpe, who prosecuted on behalf of the Inland Revenue authorities, said the articles had been advertised by means of a handbill wrapped round the bottles of medicine, and it was in this that the offence consisted. The labels placed on the bottles did not in themselves render the seller liable to the patent medicine duty. The medicines thus illegally advertised by Mrs. Lawton were "Lawton's celebrated

* Experiments of Mr. J. Bell indicate that the glycerides of butter fat contain several acid radicles in the same molecule, and therefore the butyrin cannot be separated by any process of fractional solution from the less soluble glycerides of palmitic and oleic acids. Hence butter fat probably contains complex glycerides of the following character:—

$$(C_3H_5)''' : \begin{cases} (C_4H_7O.O) \\ (C_{16}H_{31}O.O) \\ (C_{18}H_{33}O.O) \end{cases}$$

Such a complex glyceride will yield, on saponification, fatty acids and glycerin in the same proportions as would be obtained from a mixture of butyrin, palmitin and olein in the proportion of their molecular weights.

† The lower fatty acids of these oils are chiefly capric and lauric acids.

infant preservative," "Lawton's tic-douloureux drops and pills," and "embrocation for rheumatism, pains, etc.—This embrocation is invaluable in all kinds of sprains, bruises, or contusions—relieving pain."

The defendant was fined 40*s.* and costs in each case.

Mr. William Ramsden, chemist, Upper Moss Lane, was also charged with similar offences, one with respect to a bottle of medicine advertised as "an excellent remedy for neuralgia," and the other advertised as a "concentrated essence of sarsaparilla."

Defendant said he had acted quite ignorantly in the matter. He had no intention or desire to defraud the revenue, and he was satisfied that half the chemists in Manchester were doing the same thing, though that of course did not exculpate him. He did not push the sale of the medicines in any way whatever.

Mr. Headlam imposed a fine of 20*s.* and costs in the first case and ordered the defendant to pay the costs in the second case.—*Manchester Evening News.*

At the Manchester County Police Court, before Sir John Mantell and Mr. Hulme, Mr. James Bond, chemist, of Cornbrook Street, Stretford, answered to three summonses charging him with selling medicines liable to duty without having paid such duty. In two of the cases the defendant admitted the offence, but pleaded ignorance. With regard to orange quinine wine forming part of the charge, he denied that a duty was required. It was made according to instructions given in the British Pharmacopœia, and under the Pharmacy Act no duty had to be paid.

Mr. Alpe, who conducted the cases on behalf of the Inland Revenue, proved, however, that a showcard was exhibited in the defendant's shop window, calling the attention of the public to this particular preparation, which brought it within the scope of the Act and rendered it imperative that it should be properly stamped.

Defendant said there was no desire on his part to defraud the revenue. He was simply following a practice adopted by every chemist in Manchester.

Mr. Alpe said it was not properly understood in Manchester that medicines of this class were liable to duty.

The magistrates inflicted the nominal penalty of 2*s.* 6*d.* in each case and the costs.

Poisoning by Prussic Acid.

The Plymouth Coroner, Mr. T. C. Brian, held an inquest on Thursday, May 24, at the Guildhall, touching the death of Herbert Francis Montague Evans, a junior reporter, who had committed suicide on Tuesday by taking prussic acid.

Deceased was discovered lying on the bed quite dead and cold, and a bottle was found on the window sill with a label marked "prussic acid" and "poison," the latter word in two places.

The Coroner stated that deceased had pre-arranged the act, for he had spoken to his clerk (the coroner's officer) as to the best means of getting prussic acid, and the latter told him to go to the police, which he did.

Police Constable George Ryder stated that he was on duty at the Central Station. Deceased was in the habit of frequently calling there. On Thursday morning he said to witness, "I want to get rid of a large Newfoundland dog. Which is the best way?" Witness told him to poison it, and volunteered to administer poison. On Saturday morning he again came to the station, and said the dog was not getting any better, and would witness assist him in getting some poison. He said, "You know me well enough," and witness told him he had better get sixpennyworth. They then went to Mr. Wilmot's (late Lewin's) shop and asked for sixpennyworth of prussic acid to destroy a dog. The chemist gave witness the poison without any hesitation, as he was known there officially. Deceased took the bottle and he paid for the poison. He appeared quite collected and in his right senses. He said it was his father's dog and there was no chance of its recovery. Witness suggested he should bring the dog to the Guildhall and he would destroy it, but Evans said it could not walk and that he lived at Laira Bridge Terrace.

Medical evidence having been given to the effect that death had resulted from poisoning by prussic acid, the Jury returned a verdict that "Deceased died by taking prussic acid, self-administered when in a state of temporary insanity."

Reviews.

Elementary Chemical Arithmetic. By Sydney Lupton, M.A. London: Macmillan and Co.

To know chemistry it is obviously necessary to have grasped the methods of calculating employed by chemists. Formerly, when chemical students were fewer, this knowledge was usually communicated separately to pupils, or thought out by the students themselves as occasions arose. Later, as the teaching of the subject became more developed, it formed a more important part of the formal instruction given in lectures, and at present it has become a common custom for chemical lecturers to give their classes, from time to time, examples to work as exercises.

One of the first, if not the first, efforts made to supplement oral by printed instruction was the little book published by Professor Thorpe in 1872, which was intended to be associated with elementary lectures or with an elementary text-book, such as Roscoe's 'Elementary Chemistry.' Perhaps the chief objection to Dr. Thorpe's book is that the number of examples, about two hundred, is rather small, and Mr. Lupton's book is the better one on this point, since he has collected together some eleven hundred examples from various sources.

Mr. Lupton's book may be divided into three parts, first an introduction, which deals with the methods of calculating, secondly a collection of problems, thirdly several tables of data for use in solving the problems.

The introductory portion includes all, or nearly all, the methods of calculating ordinarily employed in chemistry (though we do not notice any account of those used in analyses of mixed gases, except indirectly), and indeed, occasionally strays to matters not involving calculation at all, as on page 63, where four reasons are given for considering that molecules of elements usually consist of more than one atom. Many parts of this introduction, indeed, perhaps the greater part, will serve the author's object of supplying missing ideas to pupils who have previously grasped the subject, and the easier sections will also be valuable to beginners. We regret, however, that Mr. Lupton should have limited his aim to this. Surely lecture notes ought to be enough for those who only want to recall lost ideas; whilst those for whom lecture notes are insufficient will not, we fear, find this book in all cases a sufficient substitute, though they will probably do so, as we have said before, in the easier sections. For example it would surely have been better to have given either more or less information on the methods of determining atomic weights (page 55). Except on one point (the law of Dulong and Petit) we find it difficult to imagine that this section would help much even to recall lost ideas. Altogether, while recognizing that much of the introduction will be of great value to beginners, and much more to advanced students, we cannot help regretting that Mr. Lupton has not aimed at a more complete treatment of some points.

The collection of problems is very large and very varied, and it ought to be of great assistance to students who want to test themselves and to teachers who want to exercise their pupils; both classes will be much indebted to Mr. Lupton for the amount of very tedious labour which he must have

gone through in collecting, classifying and verifying them. Their usefulness will perhaps be a little reduced by the cost of the book, and we hope that when it comes to a second edition it may be found desirable to publish a rather extended introduction separately from the collection of problems.

PRACTICAL CHEMISTRY; Analytical Tables and Exercises for Students. By J. CAMPBELL BROWN, D.Sc. (Lond.). London: J. and A. Churchill.

The production of elementary text-books on chemistry is beginning to assume a serious aspect, hardly a month passing without the appearance of a new candidate for the reviewer's approval. This over-production may partly find its explanation in the reflection that we are still accumulating experience in the methods of teaching the elements of chemistry, and having no journal specially devoted to the discussion of scientific educational questions, no sooner does a teacher think he has made an improvement in method than a text-book appears to announce, illustrate, and advocate its adoption. The perusal of many recent text-books, however, fails to disclose any advance upon the old and in many respects defective methods, and only to expose an imperfect rehash of schemes to be found in previous and more worthy works. Such productions, whose authors are evidently bent upon mere book-making, cannot be too strongly condemned, and it is the bounden duty of the critic to rigidly examine every so-called new text-book in order to see whether the contents justify its publication. The present book is perhaps exempt from this preliminary criticism by reason of its being a second edition. From its title it would be inferred that the old flimsy notion of practical chemistry, which quietly ignores more than one half of the science by excluding exercises in synthesis, is adopted. But since the book has no preface, we know not for what purpose the author intended it. Such a book consisting of analytical exercises has both its use and abuse. It is used and only rightly used when employed as a laboratory hand-book in a course of analysis, this course having been preceded by practical work in synthesis and paralleled by a course of lectures. On the other hand, if it is at once put into the hands of the beginner, which is too frequently the case, as a first course of practical chemistry, its function is mistaken and abused. For over and above the fact that synthesis is not included, the beginner who employs such a book acquires the art of chemical analysis, not rationally, but in the merest mechanical way; a knowledge of the colour of precipitates without any conception of their composition or manner of formation. Anyone who has performed the unwelcome task of examining a student who has acquired his knowledge of analytical chemistry in this way, is full well aware of the ludicrous blunders committed by such an analytical machine when it is made to work upon a substance which involves a slight departure from the routine of a "chart" and consequently the exercise of a little intelligence. A striking example of this lately occurred when such a student was given acetate of lead for examination. Lead was easily found by the application of the usual tests; the acidulous radical was next sought for, and as a matter of course barium chloride was added, with the production of a white precipitate which proved to be insoluble in nitric acid, and hence the substance was considered to be sulphate of lead.

Considering the present book as an analytical hand-book, it is better than many, in that the metals and acids are separated and the various reactions of the metals are first of all performed upon known substances before the charts are employed, but this is omitted in the case of many acids; further, also, formulæ are used to indicate the nature of precipitates and reagents, but unfortunately this plan is not consistently and uniformly adopted. Nothing is more to be deprecated than the much too common practice of commencing the study of analytical chemistry by taking an unknown substance "through a chart," and recognizing it by its behaviour when thus treated, without first having separately studied its reactions. The analytical tests and tables have, on the whole, been carefully compiled, although here and there errors are to be found. The formula of "white precipitate" is written $H_4Hg_2N_2Cl_2$; this indiscriminate and unmethodical clubbing of symbols is quite illegitimate, even in an elementary text-book; in the present instance a student might well be forgiven for inferring the substance to be a tetrabasic acid. The method for separating barium and calcium is needlessly tedious. To say that the precipitate caused by sodium hydrate in a solution of a cupric salt "is insoluble in excess, except in the presence of glucose," is very loose and misleading, and the same may be said of the statement that the flame is temporarily tinged yellow or orange by ammonium salts. Hyposulphurous acid is alone used to designate the substance more properly termed thiosulphuric acid. Hydrochloric acid certainly never precipitates HBO_2 from a solution of a borate, even "if the solution is a concentrated one." No reliable or precise method is given for the separation of tartrates and citrates. The section upon the alkaloids is scant, especially the portion relating to the alkaloids of cinchona. A violet colour is attributed to aconitine under the influence of phosphoric acid, although the incorrectness of this statement has more than once been pointed out during recent years. Taking the book as a whole, it is good of its kind, but it is a poor kind.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

THE ELECTION AND "CALIBRE" OF THE COUNCIL.

Sir,—The Council is in no need of any apologist, nor have I any desire to pose as such, yet I cannot refrain from expressing an opinion that Mr. Giles's impeachment of that august body is not justified in "fact."

Pharmacy did not die out with Messrs. Hanbury, Savory, Bell, or Deane, though the modern prototypes of some of these historic houses, with less of the spirit "æsthetic," and more of the wisdom "commercial," find it pays better to cater for ailing epicures, rather than write 'Pharmacographias.'

I have been curious enough to refresh my memory by looking through the Journal for the last twenty years, and during that period cannot find that any Council has existed with any right to boast of heavier calibre than the present; there is, indeed, nothing to quarrel about in the matter of quality, influence, or capacity, though of course one may sometimes have occasion to differ with their views and policy. At any rate, the members of the Council are fairly entitled to regard their re-election as a "vote of confidence" on the part of the Society; it admits of no other construction.

With very much of Mr. Giles's speech I cordially agree, but I must protest that we want no patronizing recognition of anybody's personal weight and importance. The Medical Council has, or ought to have, to deal with the Pharmaceutical Council, or its representatives, and not with any favoured individual it may choose to benignly smile upon.

Warrington. J. RYMER YOUNG.

Sir,—As I delivered myself of a speech intended as a defence of the outgoing, now substantially the re-elected Council, you may be good enough to permit me space to amplify the concluding sentence of my appeal to the country section of our members.

The provincial members have it in their power, when they choose to vote, to elect none but country members of Council; the Londoners voting as such can be left to sigh and moan in the cold shade of disfavour.

Now why cannot our provincial societies give us a fair sample of their best men? men who are known and looked up to for their tried abilities, or their well-defined social standing,—gentlemen who have held office as town councillors, mayors or justices of the peace? It seems to me such are more likely to have reached an independent position and acquired a matured experience, which would place them above the suspicion of having an excuse to come to London as the representatives of a mistaken local feeling.

Lest I should exceed the limits of your patience, let me repeat what I meant to say at the meeting, that country associations might very well relieve the Society from the incubus of the slowly increasing tax of travelling expenses. If Yorkshire, Lancashire, Scotland and the Midlands require "out and out" country representatives, let them pay their travelling expenses (and vote them salaries if necessary), if men of repute, position and independent means are not to be had. My argument resolves itself to this: you have in London (not necessarily cockneys bred and born) men possessing every qualification, who would willingly serve on your Council without pay or reward, but are deterred for reasons too plainly apparent to those who study the records.

T. Howard Hall.

Direct Representation upon the Pharmacopœia Committee.

Sir,—I have read with much interest the discussion and correspondence upon this subject, and I confess that I am not a little amused at the opposition raised against the Professors for an entirely voluntary act on their part. Indeed, it is quite evident that the Medical Council had a perfect right, in the absence of any legal arrangement to the contrary, to call in the aid of any persons from whom they hoped to obtain the most practical and useful knowledge, and for my own part I think that the Society is so far indebted to the Professors, who, by such a voluntary acknowledgment of their special skill, have really saved the doctors from getting it all their own way. On the other hand, I am glad to find that steps are being taken to get a legal clause inserted in the Medical Bill, which shall give to pharmacists at home that legal status in the compilation of the Pharmacopœia which has so long attained in other countries.

35, *Baker Street, W.* A. W. Postans.

Pharmacopœia Revision.

Sir,—The report of our Professors on the new Pharmacopœia bears evidence of the careful thought which one felt certain such capable authorities would give to so important a subject; but as to details, of course opinions will vary, since scarcely two pharmacists would quite agree to what should or should not be retained in the Pharmacopœia, each person necessarily being biassed by the preparations locally in demand. Nor we cannot expect our Professors, however well informed, to give to us a thoroughly representative book, unless pharmacists from various parts of Britain express their ideas as to what medicaments should be included in the new edition, which, it is trusted, will compare favourably even with recent continental and American Pharmacopœias. In order to ensure this may I be allowed to express a hope that the Professors and the other gentlemen acting on the Committee will err rather on the side of catholicity than restriction, so that the book may really represent the dispensing of the day. While warmly welcoming most of the additions proposed by the Professors, still it would be advisable to considerably extend the list. Would it not be better to include some of the following articles?—

Aloin.	Paraffin, solid.
Caffeine cit.	Quinine bromide.
Calamine, prep.	Sodii benz.
Croton chloral.	Styptic colloid.
Euonymin.	Syr. calc. lactophos.
Iridin.	Syr. hypophosphitum.
Liq. ferri dialysati.	Syr. Eastoni.
Malt extract.	Thymol.
Menthol.	Tinct. iod. decol.
Monobrom camphor.	Ung. ac. borac.
Ol. pini sylvestris.	Zinci sulphocarb.

as well as the various medicated cotton wools, lints; also to considerably enlarge the list of vapours, etc.

The three articles proposed to be omitted are somewhat open to criticism. The green iodide of mercury is still frequently prescribed, and although an unstable preparation it certainly seems wise to retain it in the Pharmacopœia so as to give standard tests and characters, and surely the two preparations of buckthorn might be retained in a Pharmocopœia which includes areca nuts. Less regret would probably be felt if aconitine and digitalin were to be relegated to the obsolete class.

With respect to the proposed change in weights, it should be remembered that the book is not only to be a class book, but the trade guide, and for the latter purpose the present weights, properly carried out into ounces and pounds, would, in my estimation, be far preferable, as a saving of time would certainly be made by it; but I would urge the printing in separate columns of the metrical weights, so as to give a greater impetus to the adoption of the latter than would the use of proportional parts.

The addition of the French and German names would be useful, and, finally, let the language of the book be Latin.

118, *High Street, Oxford.* G. C. Druce.

The Dispensing Question.

Sir,—From the absence of any mention of the "dispensing question," either in the reports of the meetings of the Council of the Pharmaceutical Society or the executive of the Chemists and Druggists' Association of Great Britain, anyone might think that it is a subject of little or no interest to chemists in general. But I feel certain such is not the case, and I think it is expecting too much of human nature that members of the above-mentioned bodies, who have extensive business relations with medical men and who must feel that any change in this direction will be of no advantage to them, but the reverse, will be likely to imitate or give every co-operation to any plan likely to bring about such results.

Rheum.

"*Edina.*"—(1) *Honkeneya peploides*; (2) *Cochlearia angelica.*

J. N.—We are unable to give you the definite reply you ask for, and can only say that we are unaware of the existence of any article bearing the name.

N. J. Lewis.—We do not think that the case referred to would be held to come within the meaning of the Act.

E. Presley.—We are not aware of any such difference as was referred to in your query, and consequently there was nothing to answer.

Oxonian.—Yes.

C. Ridgley.—We think it very probable it would be held that the use of such a label would render the preparation liable to stamp duty, but the Inland Revenue authorities are the only persons competent to give an authoritative answer to the question.

W. J. Smith.—So many works of the kind have been published that one may be found in almost every publisher's list.

A. Wrighton.—The work was reviewed in the *Pharmaceutical Journal* for April 6, 1882.

Cymro.—Apply for the information to the Secretary of the Royal College of Veterinary Surgeons, Camden Town, N.

"*Cymro.*"—The only popular treatise on the subject with which we are acquainted is now out of print.

Sterlini Oppidum.—We do not think there is such a work.

"*Querist.*"—Apply to the Secretary to the Royal College of Physicians, Edinburgh.

"*Pharmaceutist.*"—Presuming that the dose of the mixture would not be more than a teaspoonful, we do not think the quantity mentioned would be dangerous or excessive. But of course this might not be the case if it were administered to children.

Justice.—You are recommended to address your questions, together with the particulars, to the Registrar, 17, Bloomsbury Square.

Communications, Letters, etc., have been received from Messrs. Saul, Heger, Von Heyden, Jackson, Boutell, Roberts, Wilkinson, Inquirer, Conservative, One Interested, Major.

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1 to 15.

Thirty minims of this preparation diluted to 1 oz. with distilled water forms the Decotum Cinchonæ Flav. of the Pharmacopœia.

See Pharm. Journ., *March* 10, 1883.

This well known preparation contains the whole of the alkaloids of bark in combination with the natural acids, and is manufactured with great care by a process specially devised for that purpose.

It is prepared from Calisaya Bark containing a high percentage of quinine and other alkaloids, and the process used ensures that the liquor contains the quinine, and that it is not left behind in the residual bark.

Experiments lately made upon the fluid extracts of bark at present in use show that they are comparatively worthless and most expensive preparations, and that many of them contain scarcely any alkaloid.

This liquor may be depended upon as being a thoroughly representative preparation, and always of uniform composition. It will, therefore, be found invaluable to pharmacists and medical men who require to prescribe an active and reliable preparation of bark.

To be obtained of all Wholesale Houses or from the Manufacturers,

CLEAVER, BUCKWELL & CO.

9, GREAT CASTLE STREET, W.

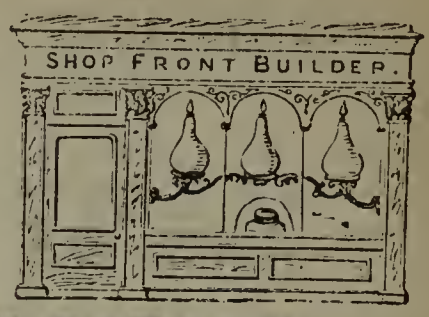
SHOP-FITTINGS.

ESTABLISHED 1830.

SAMUEL HOWLETT,

4, LINDLEY STREET (formerly called North Street), SIDNEY STREET, MILE END, LONDON, E.

A few minutes' Ride by Omnibus from the Bank.



MEDICAL AND GENERAL SHOP-FITTER.

Shops fitted by S. H., and to whom references are kindly permitted:—

Messrs. Corbyn, Stacey, & Co., 7, Poultry, E.C.
Mr. H. Deane, Clapham, London.
„ John Broad, Rise House, Hornsey Rise, N.
Etc. Etc. Etc.

Mr. N. Nicholson, Canonbury, London.
Messrs. Leath & Ross, St. Paul's Church Yd., London.
Etc. Etc. Etc.

Messrs. Harvey & Reynolds, Leeds.
Mr. W. F. Smith, 280, Walworth Road, S.E.
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Cabinet Fitter to the Pharmaceutical Society of Great Britain. Manufacturer of every description of Air-tight Glass Show-Cases for Chemists, Jewellers, etc. Medical Labelling, etc. Plans and Estimates for Entire Fittings and Alterations supplied.

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SHOP FITTERS AND SHOP-FRONT BUILDERS

WILD COURT, GREAT WILD STREET, DRURY LANE, LONDON, W.C.

Medical Glass, Earthenware, Utensils, &c.

CLOSED AT 5 P.M.; SATURDAYS, 12 A.M.

MODERN SECOND-HAND FITTINGS PURCHASED OR EXCHANGED.

MEDICAL SHOP FIXTURE WAREHOUSE.

ESTABLISHED 1830.

WILLIAM HAY & SONS,

24 & 25, LITTLE QUEEN STREET, LINCOLN'S INN, LONDON, W.C.

MANUFACTURERS OF EVERY DESCRIPTION OF

Medical Shop Fittings, Glass Cases, Drawers, Counters, Desks, Soda Water Stands, &c.

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The Largest Stock of Fittings in London.

EXPERIENCED WORKMEN SENT TO ALL PARTS OF THE COUNTRY.

NOTICE TO ADVERTISERS.

The Pharmaceutical Journal & Transactions

Has a Guaranteed Circulation of 7000 Copies Weekly.

(The LARGEST BONA FIDE Issue of any Journal addressing Chemists and Druggists.)

Terms for Advertisements may be obtained of the Publishers. Those for Businesses, Assistants, Engagements, &c., will be found on page xxii.

J. & A. CHURCHILL, 11, NEW BURLINGTON STREET, LONDON, W.

TO CHEMISTS.

An Important Addition to your Business.

NUBIAN LIQUID WATERPROOF BLACKING,
THE ORIGINAL AND SELF-SHINING. ☞ NO BRUSHES REQUIRED.
Easily applied with sponge attached to the cork. Keeps its polish for a week in all kinds of weather.
Cleanest, Best, and Cheapest for Boots, Shoes, Harness, and all Leather Goods.
Price **1s.** and **2s.** per Bottle.

NUBIAN FURNITURE POLISH,
In Glass Bottles and Cartoons.
Easily applied with sponge attached to cork. Will not smear or clog, and produces a brilliant polish with little labour. Price **6d.**

LADIES' "PET" BOOT POLISH.
A Light Dressing for Ladies' and Children's Boots.
A Preparation which does not soil the most delicate clothing, and will not harden or crack the leather or peel off. Price **6d.** per Bottle.
THE NUBIAN MANUFACTURING COMPANY, 8 & 9, Hosier Lane, Snow Hill, London, E.C.

GEORGE TREBLE & SON,

SHOP FITTERS AND SHOW CASE MAKERS.

PLANS AND ESTIMATES SUPPLIED.

BRIDGE WHARF, WHITMORE ROAD,
HOXTON, LONDON, N.

Agents—S. MAW, SON & THOMPSON, 7 to 12, Aldersgate Street, CITY.

GREAT SAVING OF MONEY AND LABOUR.

SOMETHING NEW

ELEGANCE AND DURABILITY COMBINED.

PATENT RECESS LABELLED SHOP ROUNDS. Parties about to Open New Establishments or Refit Old Premises, should compare following Net Prices. *These Prices include Glass Labels attached to Bottles ready for use.*

Size.	Height.	Flint Glass. N.M.	Flint Glass. W.M.	Blue Glass. N.M.	Blue Glass. W.M.
16 ounce	8 inches	16/6	18/6	20/	22/ per dozen.
20 ,,	9 ,,	17/6	20/	21/	23/ ,,
32 ounce	10½ inches	20/	22/	22/	26/6 per dozen.
42 ,,	11 ,,	22/	25/6	26/6	30/ ,,

Prices of other Shop Bottles, &c., on application. *Sample Bottle sent on receipt of* 1s. 7d. *in stamps.* *Fac-Simile* sheet Labels, in various styles, sent on receipt of two stamps. *Amongst others, the following parties have recently been supplied with these Bottles:—*

Ady, Dr. J. C., Rangoon
Beckwith, H. B., Grenada
Bilton, J. W., Stoke-on-Trent
Blair, John, Cork
Boot, J. & M., Nottingham
Brevis, John, West Hartlepool
Brumwell, H., Sutton, St. Helens
Brunton, W. W., South Kensington, London
Catford, O. W., Crewkerne, Somerset
Cullen & Co., South Norwood, London
Day, J., Savile Town, Dewsbury
Drummond, J. A., Belfast
Gardner, A. W., Auckland, N.Z.
Gibbs, R. D., Smethwick
Hardcastle, J., Waterloo Road, Leeds
Lodge, G. H., Rotherham.
Mason, W. D., Grimsby
Maston, G., Hartlepool
McCaul, J. & G., Londonderry
McRae, Alexander, Edinburgh
Morris, J. L., Moss Side, Manchester
Parsonson, T., Jersey
Pattison, H., Colehain, Shrewsbury
Pittuck, F. W., Hebburn-on-Tyne
Quiray, W. D., Belfast
Rand, E., Wagga-Wagga, New South Wales
Robinson, H., Guisely, Leeds
Senior, Harold, Norwood Lane, London, S.E.
Sibthorpe, S., Wolverhampton
Smith, Albert, Ilfracombe
Taylor, W. G., Hungerford
Walton, M. F., Sowerby Bridge
Waterhouse, A., Dewsbury
Wills & Wootton, Westminster College
Wing, Lewis, Chislehurst
Woodcock, A., Coltishall, Norwich

Sole Agents: GLASGOW APOTHECARIES' COMPY, Virginia St., Glasgow.

66, PENTONVILLE ROAD, LONDON, N.

W. J. LEMAITRE & CO.

ESTABLISHED 1830.

Manufacturers of

COUNTER SHOW CASES,
BRASS WINDOW FITTINGS,
POLISHED-EDGED GLASS SHELVES,
COUNTERS, DRAWERS, DESKS, &c.

MEDICAL & GENERAL

SHOP FITTERS

WRITERS, DECORATORS, &c.

Estimates Free.

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MEDICAL LABELLING,
WOOD AND GLASS LETTERS,
FACIAS AND WIRE BLINDS,
BOTTLES, CARBOYS, &c.

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Hunyadi János

CAUTION.—Circumstances which have come to the knowledge of Andreas Saxlehner, Buda Pest, Sole Proprietor of the Hunyadi János Spring, compel him to WARN the British Public against SPURIOUS IMITATIONS. To secure genuineness, purchasers should see that every bottle has on the LABEL the name of

"THE APOLLINARIS COMPANY (LIMITED), LONDON."

THOS. CHRISTY & CO.

155, Fenchurch Street, London, E.C.

ARE NOW OFFERING:

Grindelia Robusta; Araroba; Quince Seed; Chaulmugra Oil; Euphorbia Pilulifera herb; Menthol Cones; Myocom Fly Gum; Boldo leaves; Damiana herb; Papaw Juice, etc.

Apply for New Price List, just published.

SYMES & CO.

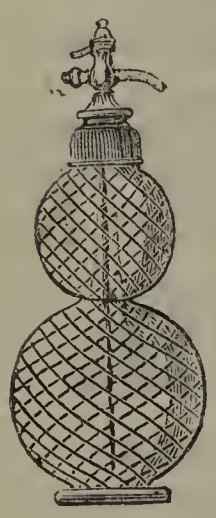
LIVERPOOL,

Importers of Brazilian Drugs

Araroba, Caroba, Jaborandi, Baycuru, Guaco, Quebracho, Tayuya, Coca, Tonquin Beans, &c.

EUGENE GERAUT & CO.'S

New Patent Lever Seltzogenes



Wholesale Prices as follows:—

3-pint, wire 13s 0d. | 5-pint, wire 18s.
3-pint, cane 13s. 6d. | 5-pint cane 19s.
8-pint, wire, 30s.; cane, 32s.
3-pint size, strongly silver-plated, richly decorated Porcelain stands .. .. each 30s.
5-pint ditto . 38s. | 8-pint ditto . 48s.

IMPORTANT NOTICE!

For orders of three, 15 per cent. Large discount allowed off quantities upwards. Strongly silver-plated top, 5s. extra.

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	12 Charges Per doz. Boxes.	10 Charges Per doz. Boxes.
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5-pint do. do.	30s.	26s. 0d.
8-pint do. do.	51s.	44s. 6d.

Liberal Discount.

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Clear or coloured glass, viz., red, blue, green, or yellow, warranted pure ENGLISH BLOCK TIN TOPS, with piston or cap, 22s. 6d *per dozen or* £13 10s. *for quantities of not less than one gross.* PACKING IN CASK 5s. PER GROSS.

The Name marked on the metals free of charge for quantities of not less than one gross. The Name engraved on the glass with Trade Mark, 1s. 6d. and 2s. per dozen extra.

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Registered—No. 3745.

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(LATE OF HOXTON),

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GUTTA PERCHA ENAMEL,

FOR STOPPING DECAYED TEETH.

P. A. S. can supply the above to Wholesale Houses, in any quantity, with their name stamped upon each piece, cut in sticks any length.

The above to be obtained of all Wholesale Houses. Price List and Samples sent Post Free.

SPECIAL NOTICE.—The words SILVERY WHITE GUTTA PERCHA ENAMEL are registered as a Trade Mark, and will be protected.

GOLD MEDAL, ADELAIDE, 1881.

ESTABLISHED 1824

TRADE P MARK **NEEDHAM'S** TRADE P MARK

POLISHING PASTE

AFTER BEING IN USE FOR OVER 50 YEARS IS ACKNOWLEDGED TO BE THE BEST CLEANER AND POLISHER OF BRASS COPPER BRITANNIA METAL &c &c ALSO

PICKERING'S

FURNITURE POLISH

PLATE POWDER &c

SHEFFIELD

Joseph Pickering & Sons, Alsyn Works, Sheffield.

PURE AËRATED WATERS.

J. H. THOMAS & SONS'

SODA WATER.	LEMONADE.
POTASS WATER.	LITHIA WATER.
SELTZER WATER.	*GINGER ALE.

* *The best Ginger Ale in the Market.*

These Aërated Waters have stood the test for upwards of 50 years, and are second to none for Purity and Quality. Sold by all respectable Chemists, Wine Merchants, Hotels, &c. All Corks are branded "J. H. THOMAS & SONS, Boston." For Terms and Show Cards apply to

J. H. THOMAS & SONS,

Chemists and Wine Merchants, Boston, Lincolnshire.

REGISTERED.

PURE AËRATED WATERS

Ellis's Ruthin Waters,

CRYSTAL SPRINGS.

Soda, Potass. Seltzer, Lemonade, Lithia, and for GOUT, Lithia and Potass.

CORKS BRANDED "R. ELLIS & SON, RUTHIN," and every label bears their trade mark. Sold everywhere, and Wholesale of R. ELLIS & SON, Ruthin, North Wales. London Agents: W. BEST & SONS, Henrietta St., Cavendish Sq.

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who, from his exhaustive analysis of Ginger, is probably the greatest authority on the subject, says of

Fisher's Soluble Essence of Ginger:

"It is typical of what such a preparation should be; it is by far the best commercial soluble Essence I have yet seen, and I doubt the possibility of making a stronger or better."

Dr. Thresh's full report, samples and quotations, will be forwarded on application to the maker,

F. D. FISHER, Pharm. Chemist, Grantham.

BINGLEY'S
SUPERIOR
GINGER ALE

After numerous experiments the Proprietor is enabled to offer a beverage which is considered by many to be one of the *very best* of its kind.

It is manufactured especially for sale by Chemists doing a family trade.

COMPARISONS ARE INVITED.

Samples may be obtained *gratis*, also trade terms, on application to

J. BINGLEY, NORTHAMPTON.

See Chemist and Druggist, January last, page 33.

BATHS OF HOMBURG

Near Frankfort-on-the-Maine.

The HOMBURG WATERS are very EFFICACIOUS and SALUTARY in Diseases of the STOMACH and LIVER and in attacks of the GOUT.

UNRIVALLED SUMMER CLIMATE. SOVEREIGN CURE IN NERVOUS DEBILITY. The pure and bracing air from the mountains contributes largely to invigorate the system.

GRAND BATHING ESTABLISHMENTS, where baths of MINERAL and soft water are given, under medical prescription, with addition of MOTHER LYE, EXTRACT OF PINE, liver of SULPHUR, &c. MOORBATHS highly recommended for rheumatism.

INHALATION from VAPORIZED SALT WATER for affections of the THROAT and the LUNGS.

Two Establishments for COLD WATER CURE, one of them in conjunction with a Gymnastic-orthopædic Institution.

WHEY CURE and Goats' Milk. All kinds of Mineral Waters can be obtained.

First-class Orchestra, Regimental Bands, Balls, Réunions, Operas, Grand Concerts, Illuminations, Fireworks, Fêtes, Champêtres, &c. Toupie Hallandaise, Bagatelle, CRICKET and CROQUET, LAWN TENNIS. Good Shooting and Fishing in the neighbourhood.

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Beautiful PARK with shaded walks and comfortable seats. Extensive Carriage Drives through a vast Pine Forest. CHARMING ENVIRONS,

PURE AND LIMPID DRINKING WATER. Excellent drainage. Every condition of Hygiene fulfilled. Superior Hotels and Lodging Houses at moderate prices. Half an hour's railway ride from Frankfort-on-the-Maine.

THE MINERAL WATERS EXPORTED TO ALL PARTS OF THE WORLD.

KANGRA VALLEY
INDIAN TEA GROWERS' ASSOCIATION
7, NEW COVENTRY STREET,
LEICESTER SQUARE, W.

PROSPECTUS.

The object of the Planters who have formed this Association is to establish a business for the direct supply of Tea from the Plantations of the Kangra Valley to the public.

So great a success has attended the efforts of the promoters of the Association that it has become necessary that one of the Planters should reside in England to manage its affairs.

The distinctive feature of the business of this Association is that the Tea is delivered to consumers in the original One Pound tin-foil lined parcels in which it is packed in the Valley, and it is guaranteed to be absolutely pure.

Vide **Allen's Indian Mail**, Feb. 28, 1883:—"* * * We can speak from actual knowledge of the excellence of the Teas of the 'Kangra Valley Indian Tea Growers' Association,' and as in advertising them we are also benefiting those who take advantage of their enterprise, we append their modest prospectus, which promises no more than they are well able to perform."

These Teas, retailing respectively at 4/, 3/, and 2/6, can be purchased in any quantity, either direct from the Store, 7, New Coventry Street, or from

Messrs. BARCLAY & SONS, 95, Farringdon Street,

Agents to the Association, from whom Show Cards can be had on application.

Special Terms granted to all Chemists and Druggists, to whom the Teas, on account of their absolute purity, are particularly recommended.

COOPER'S
SHEEP DIPPING POWDER

Is soluble in COLD Water, and should be used in preference to any other dip.

FOR TICKS, FLY, SCAB, AND FOR ALL OTHER SHEEP DIPPING PURPOSES.

This Dip has been in use for 40 years, and has never been equalled; it is of uniform strength, does not stain the wool, is suitable for all climates, and equally good as a Summer or Winter Dip. It is especially recommended for Dipping Lambs and as a certain Cure for Scab.

It supersedes all Carbolic and other Liquid Dips, being so much more reliable and lasting in its effects.

Counter Bills and Directions in English, Spanish, Dutch, &c., may be had free on application.

Terms and all particulars may be had of the Proprietor,

WM. COOPER, M.R.C.V.S., Chemical Works, Berkhamsted, England.

Chemists' Tea Agency.

WALKER & DALRYMPLE'S
BROKEN-LEAF TEA, 1s. 8d. per lb.
A MONEY SAVING TEA. ABSOLUTELY PURE.
The small leaf from some of the finest India and China Teas. Produces a tea in the cup stronger, richer, and cheaper than most whole-leaf teas. Agents appointed, where unrepresented, throughout the United Kingdom.

WALKER & DALRYMPLE'S
INTERMEDIATE TEA, 2s. per lb.
BEST at the PRICE EVER SOLD. Great strength, and a most useful tea where there is a large consumption. Recommended to all who wish to SAVE in their tea. Agents appointed, where unrepresented, throughout the United Kingdom.

WALKER & DALRYMPLE'S TEAS.—AGENTS APPOINTED, where unrepresented, throughout the United Kingdom.
Prospectus and samples free on application.
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COWAN'S VACCINATION SHIELDS,
As inferior articles are in the Market.
From all Wholesale Houses.
WILLIAM COWAN,
INVENTOR AND MAKER OF THE VACCINATION SHIELD,
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E. PLOMER & CO.

Chemists to the Viceroy of India,
SIMLA and LAHORE.
London Agents: Messrs. A. DURANT & CO., 89, Gresham St. E.C.

BRADLEY & BOURDAS'S
Albatum or White Rouge, for Cleaning Gold, Silver and Plated Goods.
Since its introduction as a substitute for the ordinary Rouge, a quarter of a century ago, the sale has amazingly increased both at home and abroad. A trial is only needed to prove its superiority over other Plate Powders in use. Sold in Boxes at 1s. and 2s.; Tins, 6s.
6, PONT STREET, BELGRAVE SQUARE, and 48, BELGRAVE ROAD, S.W. } LONDON.

Certain Sudden DEATH to all Grubs, Aphis, Lice, Red Spider, Thrip, Mealy Bug, etc.
Perfectly Harmless to the Hands and Skin, but will cure Ringworm and all diseases produced by parasites.

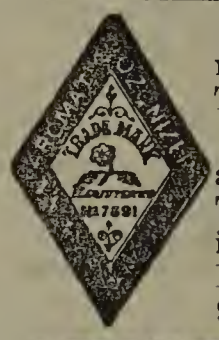
FIR TREE OIL
(SOLUBLE) INSECTICIDE

A combination of Hydrocarbon Oils made Soluble in Water. **For destroying ALL INSECTS and PARASITES that infest Trees and Plants,** whether at the Roots or on the Foliage. It cures Mildew and Blight on Fruit or Foliage, and a weak solution Kills all Vegetable Grubs, Turnip Fly, &c. Cleans Grapes from Mildew or Mealy Bug without affecting the bloom; and, thickened with a little clay, makes a good winter dressing. Destroys Lice and Fleas on Animals. Sold by Seedsmen and Chemists, 1/6, 2/6, 4/6 a bottle. Per gallon 12/6, or less in larger quantities. Each bottle bears the inventor's Trade Mark (a Cat's Head) and full directions for use. Wholesale: BARCLAY and EDWARDS, London; RAIMES, Edinburgh and York; EVANS, Liverpool; and D. MCLAREN, Edinburgh.—New York: ROLKER & SONS. *Manufacturer*, E. GRIFFITHS HUGHES, Manchester.

THE ORIGINAL
ARNICATED
WHITE FELT
CORN AND BUNION PLASTERS,
INVENTED AND ESTABLISHED BY
HENRY YOUNG,
A.D. 1846,
AND FAVOURABLY KNOWN ALL OVER THE GLOBE.

SUPPLIED BY ALL WHOLESALE HOUSES.
N.B.—Please see that YOUNG'S Goods are supplied, as there are many worthless imitations.

Manufactory, 72, Clerkenwell Rd. London, E.C.
(LATE OF CARTHUSIAN STREET.)



RIMMEL'S TOILET VINEGAR, the most tonic and refreshing Lotion for the Toilet or Bath, 1s., 2s. 6d., and 5s.
RIMMEL'S AROMATIC OZONIZER, a fragrant powder of Pine and Eucalyptus. The most effective and only agreeable disinfectant. In Tins, 1s. E. RIMMEL Perfumer to H.R.H. the Princess of Wales, 96, Strand, London.

SAVARESSE'S CAPSULES
of membrane, each containing 15 drops Pure Maranham
COPAIBA BALSAM,
or, also of membrane, each containing 10 drops Purest Yellow
SANDAL WOOD OIL.
The efficacy of these valuable medicines is due to the ABSOLUTE purity of the Balsam or Oil, and to the very GRADUAL solvability of the membrane as compared with gelatine. Copaiba, 2s. 6d., 18s. doz. Sandal, 4s. 6d., 36s. doz. EVANS, LESCHER & WEBB, London; EVANS, SONS & Co., Liverpool.

JAMES'S FEVER POWDER,
Prepared by J. L. KIDDLE, Chemist,
Late of 31, HUNTER STREET, BRUNSWICK SQ.,
LONDON.
Sold in BOTTLES *containing* ONE OUNCE, *at* 4s. 6d., *and* PACKETS *at* 2s. 9d. *each.*
Messrs. BARCLAY & SONS, 95, Farringdon Street, London, have been appointed **Sole** Wholesale Agents from this date.
January, 1878. J. L. KIDDLE.

SAVARS CUBEB CIGARETTES. Cubebs Stramonium and Cannabis Ind, (soothing). Relief in Asthma, Throat Cough, Bronchitis, Influenza. A specific against fogs. Boxes (12) 1s., 9s. per doz.; (36) 2s. 6d., 24s. per doz. Full directions. EVANS, LESCHER & WEBB, London. EVANS, SONS & CO., Liverpool. Samples gratis, post free.

"FOR THE BLOOD IS THE LIFE."
TRADE MARK—"BLOOD MIXTURE."
CLARKE'S
WORLD FAMED
BLOOD MIXTURE.
The Great Blood Purifier & Restorer.

The celebrated Cure for Scrofula, Scurvy, Skin and Blood Diseases, and Sores of all kinds. Wholesale of all Patent Medicine Houses, at 24*s.* and 108*s.* per dozen, less the usual discount.
Sole Proprietors, THE LINCOLN & MIDLAND COUNTIES' DRUG COMPANY, Lincoln.
Printed Matter Supplied in any Language for Foreign Agents.

PRIZE MEDAL 1862.

EWEN'S LARD, MARROW, & SUET.

These FATS, *being absolutely* PURE, *and free from* SALT, CHEMICALS, *or* WATER, *are* SPECIALLY ADAPTED FOR PHARMACEUTICAL, PERFUMERY, *and* CULINARY *purposes.*

Manufacturers of MUSK, GLYCERINE, ROSE, BROWN WINDSOR, BRAN, TAR, SKIN, TOILET, ELDERFLOWER, OATMEAL, HONEY, ALMOND, and all other kinds of **FANCY SOAPS**, in Squares, Tablets, or Bars. VIOLET POWDER, POMADES, COSMETIQUES, &c.

JAS. EWEN & SONS, 5, Hatfield St., Blackfriars, S.E.
WHOLESALE AND FOR EXPORTATION.
ESTABLISHED OVER HALF A CENTURY.

Dr. C. R. COFFIN'S AMERICAN DENTIFRICE

PREPARED only by WILLIAM DARLING, Chemist, Manchester. May be had from S. Maw, Son & Thompson; Barclay & Sons; F. Newbery & Sons; Sanger & Sons; and any Wholesale House in London. Price 2s. per Box, and Family Jars 10s. each.

STUDENTS' AIDS TO EXAMINATION.

PRELIMINARY.—Arithmetic and Metric System, 1s. How to Write an Essay, 6d. Latin Grammar and Cæsar Simplified, 1s. MINOR.—Equations Simplified, 1s. Illegible Autograph Prescriptions, 1s. Minor Questions, 1s. Notes on Dispensing, 1s. Prescriptions given at the Minor, 1s. For "How to Prepare for either Exam.," enclose stamped envelope, CHEMIST, care of Mr. J. Edwards, Wye, Kent. Herbarium of Plants, 6s.

INDIAN MEDICAL SERVICE.

India Office, 19th May, 1883.

NOTICE is hereby given, that an Examination of Candidates for five appointments as Surgeon in Her Majesty's Indian Medical Service will be held in London on the 13th August, 1883, and following days.

Copies of the Regulations for the Examination, together with information regarding the Pay and Retiring Allowances, &c., of Indian Medical Officers, may be obtained on application at the Military Department, India Office, London, S.W.

The necessary certificates must be submitted to the Military Secretary so as to reach his address at least a fortnight before the date fixed for the examination.

ALLEN JOHNSON, Major-General,
Military Secretary.

"SYSTEMA OMNIA VINCIT."

SOUTH LONDON SCHOOL of PHARMACY

325, KENNINGTON ROAD, S.E.

Director: Dr. JOHN MUTER, M.A., F.I.C., F.C.S., &c.

FOURTEENTH SESSION, 1883-4.

Entries now being made for the 10th September. Fees, Syllabus, &c., apply to W. BAXTER, Secretary.

TO Parents, &c.—Vacancy for Pupil (in or out-door). A light and remunerative calling. Highest professional references to class of work instruction would be gained from. Mr. WHITEHOUSE, L.D.S., Dentist, 50, Parliament St., S.W.

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The next Session of this School will commence on Monday, September 3, 1883, and the Principals will be glad to have an early intimation from Students who intend joining at that date. The lectures given at this School are delivered in as practical a manner as possible, and specimens are provided for the Students at the Practical Botanical Classes free of cost.

PRIVATE TUTOR

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(*From the Royal School of Mines*),
130, CAMDEN ROAD, N.W.

SIX of my Students presented themselves at the April Minor, **FOUR** passed—all at their first attempt. Those wishing to attend my "practical demonstrations" for the June or July Minor are requested to apply, as my few vacancies are fast filling. **PERSONAL TEACHING. NO DEMONSTRATORS.** Postal Instruction. Enclose stamp for particulars; or "at home" daily from 1.30 to 2.30.

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THE

WESTMINSTER COLLEGE

OF

Chemistry & Pharmacy.

The next Session will commence on Monday, September 3rd.

Students desiring to enter the School at the commencement of the Twelfth Session, on 3rd September, should send in their names without delay, as the few remaining benches in the Laboratory are being rapidly filled up. The regular course is three months, but those already possessing knowledge may enter at any time when there is room.

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October Examination	£5 5s.
December ,, ...	£8 8s.
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PIDGEON, J. D. | SPENCER, G.
* SMITH, W. T.

MINOR.

* BADCOCK, H. D.
BANBURY, R.
BARLOW, G.
CARTER, W.
CORDER, W. S.
CURNOW, W. A.
* CUNNINGHAM, O. W.
CODLING, A. J.
* DULLEY, D.
* DUNBAR, G.
* EDWARDS, R. W.
ELSTOB, JNO.
* GEORGE, I.
HEPPLE, T.
HILL, J.
HORNE, C.
* JEANS, A.
* KING, A.
* MIDGLEY, W.
MAY, S. A.
MALLETT, J. T.
* PEARSON, W. J.
* RAWLINGS, W. J.
* ROBERTS, A. H.
* TROAKE, C. F.
* WALKER, G. J.
WOOD, E. J.

PRELIMINARY.

ANDREWS, E. A. | LETHEREN, E. J.
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* BADCOCK, H. D. | * KING, A.
* CROFTS, J. E. | * HALTON, J. H.
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* These Gentlemen were resident students.

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The Pharmaceutical Journal AND Transactions.

THIRD SERIES, No. 676.] SATURDAY, JUNE 9, 1883. [PRICE FOURPENCE.

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INDEX TO THE PHARMACEUTICAL JOURNAL FROM JULY, 1868, TO JUNE, 1878.

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KILNER BROS., Glass Bottle Manufacturers,

Solicit orders for MEDICAL DISPENSING BOTTLES (Green and White Flint) and other kinds used by Chemists.

Also for their new Feeders. "OUR BABIES' BOTTLE."

(6d. Retail) 36s. 38s. 42s. AND 44s. per Gross.

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BETTS & CO. LIMITED

(ESTABLISHED IN 1840),

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Coloured Side Mark, Label, and other Speciality Capsules

(For the Prevention of Fraud and Refilling of Old Labelled Bottles)

As supplied to Bass & Co., and the leading Brewers and Bottlers of Wines and Spirits throughout Europe.

PLAIN ORDINARY CAPSULES,

For Small Phials, **2s. 6d.** and upwards per 1000, according to size, style, design, and quantity.

SPECIAL CONTRACTS FOR CONTINUOUS DEALING.

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PURE ENGLISH MADE BOTTLING AND PACKAGE TINFOIL

From **1s.** per lb., and upwards. **MIXED FOIL** (Foreign Quality), from **6d.** per lb. (according to gauge).

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ESPECIALLY ADAPTED FOR CHEMISTS' COUNTERS.

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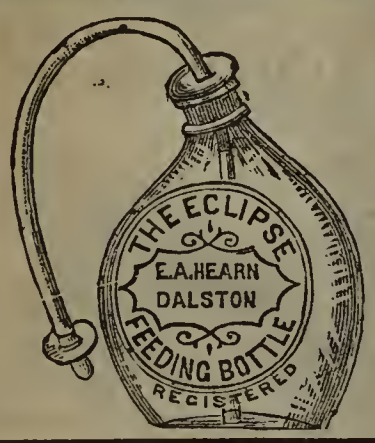
White Fittings, **30/-** per gross.
Best Black Fittings, **38/-** "



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GLASS BOTTLES of EVERY DESCRIPTION, either PLAIN or STOPPERED, made in WHITE, BLUE, AMBER, ACTINIC GREEN, or any other colour required.

SPECIAL ATTENTION GIVEN TO QUALITY.

Quotations, post free, to any part of the world on application.

The above will be found the BEST and CHEAPEST House in the trade.

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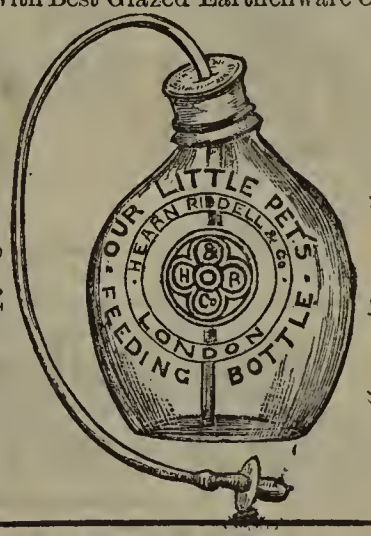
Each Bottle, with two Brushes, put in Handsome Cardboard Box, bearing our Copyright Label.



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DOG MEDICINES AND SOAP

TASTELESS APERIENT BISCUIT FOR DOGS.

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CURES ALL KINDS OF CUTS, BRUISES AND WOUNDS IN MAN AND ANIMALS.

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CAUTION.—Circumstances which have come to the knowledge of Andreas Saxlehner, Buda Pest, Sole Proprietor of the Hunyadi János Spring, compel him to WARN the British Public against SPURIOUS IMITATIONS. To secure genuineness, purchasers should see that every bottle has on the LABEL the name of

"THE APOLLINARIS COMPANY (LIMITED), LONDON."

Spiritus Ætheris Nitrosi

Guaranteed to contain the proportion of Nitrous Ether directed by the British Pharmacopœia.

Æther Nitrosus and Sol. Ætheris Nitrosi

Respectively 8 and 4 times the strength of the Spirit.

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Distilled from Volcanic Ammonia.

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THIRTEEN PRIZE MEDALS, FIVE GOLD.

BOND'S CRYSTAL PALACE GOLD MEDAL MARKING INK.

By Official Appointment to the QUEEN and COURT OF HOLLAND. Certificate of Merit signed H.R.H. PRINCE OF WALES.

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Novelties given away with every doz.

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NO heating required, and will resist boiling Chloride of Lime.

To avoid spurious imitations, see that the words "**Daughter of the late JOHN BOND**" appear on the Labels. (*See that you get it*). The Academie Nationale Society of Manufactures and Commerce, Paris, have awarded me the Grand Diploma and Premier **GOLD MEDAL** for perfection in Marking Inks. *Extract from the "Academie Journal," April*, 1870: "We have tested fifty Marking Ink Makers' preparations since 1855, and pronounce this the most successful article."
Works: 75, SOUTHGATE RD., LONDON. *Shippers and others please send for Illustrated Price List. Free Carriage on parcels of £5 & upwards.*

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Guaranteed to contain Mushrooms, in Casks as under—

9 gals.	...	...	...	1/3 per Gallon.
18 „	...	...	...	1/2 „ „
30 „	...	...	...	1/1 „ „
60 „	...	...	...	11½ „ „

WORCESTERSHIRE OR YORKSHIRE SAUCE, IN CASKS, ANY SIZE.

No. 1 Quality	...	...	2/- per Gallon.
2 „	...	...	1/6 „ „
3 „	...	...	1/- „ „

TERMS: 1 MONTH, NET.

All Orders to HYSLOP & RUSSON,

THE WORCESTERSHIRE SAUCE AND PICKLE CO.

WORCESTER WORKS. BIRMINGHAM.

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A POSITIVE CURE FOR STOMACH, LIVER & KIDNEY AFFECTIONS.

The Only Palatable Natural Aperient Water.

THE BEST HOUSEHOLD REMEDY & SPECIFIC FOR CONSTIPATION.

Highest Award at the International Medical Exhibition, 1881. Retail 1/6 & 2/- per Bottle.

A SUPPLY OF CIRCULARS WITH NAME AT FOOT AND DESCRIPTIVE PAMPHLETS FREE ON APPLICATION.

Chemists can safely stock this Water, as it will continue to be well advertised.
It is prescribed by all the leading Medical Men.

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FRY'S MALTED COCOA AND FRY'S MALTED CHOCOLATE

Are combinations of FRY'S PURE COCOA EXTRACT and CHOCOLATE PASTE with ALLEN & HANBURYS' CONCENTRATED EXTRACT of MALT, affording delicious beverages. The Extract may be most agreeably taken in either of these forms. Sold in tins at 1s. and 2s. each, 9s. and 18s. per dozen. The COCOA is in the form of Powder, the CHOCOLATE of PASTE, and sweetened.

Lancet, December 18th, 1880:—"This is an excellent preparation of Cocoa and Malt Extract. It is dried at a gentle heat, to avoid injury to the diastase; its dietetic and digestive value is beyond all dispute, and it is very agreeable in flavour."

See also—*British Medical Journal*, Nov. 13th, 1880; *Medical Times & Gazette*, Jan. 1st, 1881; *Medical Press*, Jan. 26th, 1881.

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CLARIDGE & CO. CHEMISTS,

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Manufacturers of First-class Mineral Waters.

Soda, Potash and Lemon Waters, 1s. 6d. per dozen.
Splits of above, 1s. per dozen.
Lithia and Seltzer, 2s. 6d. per dozen.
Aërated Waters, in French Syphons, 3s. 6d. per dozen.

Carriage paid on 12 dozens to any address.

CHARACTERISTICS.—*Careful preparation—thorough impregnation and delicate flavour—please where introduced.*

Sample order solicited.

TASTELESS PILLS

(COX'S PATENT.)

Dated and Sealed April 13, 1854.

Chemists selling TASTELESS PILLS *have an advantage over others neglecting to do so.*

We strongly recommend our Aperient Pills at 6s. and Compound Rhubarb at 7s. per pound, coated, as saleable Pills. These, or any Pills in our list, are sent out to every part of the United Kingdom in half-pound parcels, package, postage, and carriage free, on the same day as the order is received; and, to avoid booking and other expenses, 1d. in the Shilling will be allowed if stamps or P.O.O. are remitted with order.

Twenty years' success, as proved by unsolicited Testimonials from Medical Men in almost every town and village in the kingdom, has produced imitations likely to bring a useful invention into disrepute, as a large percentage of the Varnished Pills made to imitate ours pass through the stomach unaltered.

The Registrar of Trade Marks (after giving the usual public notice prescribed by Parliament to allow of opposition) has granted us the above "Trade Mark," thus officially recognising us as the "ORIGINAL MAKERS OF TASTELESS PILLS," and no pills will be sent out without this mark on all bottles or packages.

Any Formulæ Dispensed, Covered, and Estimates given.

Samples, with a list of pills from upwards of 500 different forms which are kept in stock, will be forwarded free on application.

ARTHUR H. COX & CO. *Tasteless Pill Manufacturers,* **Brighton.**

BENGER'S PREPARATIONS.

These Preparations received a FIRST-CLASS AWARD (the Highest Obtainable), at the INTERNATIONAL MEDICAL AND SANITARY EXHIBITION, SOUTH KENSINGTON.

LIQUOR PANCREATICUS (BENGER)—For the Preparation of Peptonised or Artificially Digested Food. Bottles, 2s. 6d., 4s. 6d., and 8s. 6d., with full directions.

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BENGER'S PEPTONISED BEEF JELLY—May be taken by teaspoonfuls as a quick restorative, or used to fortify ordinary beef-tea, soups, &c. Tins, 2s. each.

BENGER'S SELF-DIGESTIVE FOOD—For Infants and Invalids. When mixed with warm milk, digestion of the whole commences at once. Tins, 1s. 6d. and 2s. 6d.

Of all leading Wholesale and Retail houses.

MANUFACTURERS,

MOTTERSHEAD & CO. Pharmaceutical Chemists,

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CANTRELL & COCHRANE'S

CELEBRATED

AROMATIC GINGER ALE, SPARKLING MONTSERRAT, CLUB SODA, AND MINERAL WATERS,

As supplied to Her Majesty's Imperial Houses of Parliament,

Have been Awarded NINETEEN GOLD AND PRIZE MEDALS at the various International Exhibitions.

Goods for Export are specially prepared, and are guaranteed to keep in any climate.

PRICES AND TERMS ON APPLICATION TO

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T. & F. J. TAYLOR'S

TRADE N & P MARK.

AËRATED WATERS,
NEWPORT PAGNEL.

ESTABLISHED 1835.

SODA, POTASH, SELTZER, AËRATED (without Alkali), and LITHIA WATERS. LEMONADE & GINGER ALE.

Each Bottle is protected by a Label bearing the Signature of the Firm.

Purity and Excellence of the Water certified by Analysis by Professor ATTFIELD, Ph.D., F.C.S.

TRADE ELLIS MARK. CYMRYAM BYTH

REGISTERED.

PURE AËRATED WATERS
Ellis's Ruthin Waters.
CRYSTAL SPRINGS.

Soda, Potass, Seltzer, Lemonade, Lithia, and for GOUT, Lithia and Potass.

CORKS BRANDED "R. ELLIS & SON, RUTHIN," and every label bears their trade mark. Sold everywhere, and Wholesale of R. ELLIS & SON, Ruthin, North Wales. London Agents: W. BEST & SONS, Henrietta St., Cavendish Sq.

SUGAR COATED PILLS

R. HAMPSON prepares the Pills of the Pharmacopœia, and a great variety of Pills from useful formulæ. The Pills are made of the best ingredients, and being *quickly* diffusible always give satisfaction. A Price Current and sample post free. Supplied direct or through the Wholesale Houses. Special quotations for large quantities.

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IT has been decided in various Chancery suits, that ROSE & CO., London, are the original introducers of LIME JUICE CORDIAL. Purchasers can therefore protect themselves against imitations of this refreshing beverage by ordering ROSE'S CORDIAL. It is prepared from the Lime Fruit, and entirely free of alcohol, supplying a delicious cooling drink in water, effervescing in all Mineral Waters, and an excellent stimulant blended with spirits. It possesses valuable medicinal properties, cooling and purifying the blood, an excellent stomachic, assisting digestion. Recommended by the *Lancet* and Medical Professions as eminently wholesome. Sold by Grocers, &c.

SPECIAL EXPORT TERMS.

The increasing demand for Export establishes it as a successful shipment to all the warmer latitudes. Labels bear the signature of the firm.

L. ROSE & CO., 11, CURTAIN ROAD, LONDON.

REFINERY AT LEITH, SCOTLAND.

ALLEN & HANBURYS'

EFFERVESCENT APERIENT SALINE

This is a finely granulated preparation, which in dissolving produces a sustained sparkling effervescence, and a clear, bright solution. It possesses all the advantages of an agreeable saline, combined with the anti-febrile properties of Chlorate of Potash, of which it contains a considerable percentage. It is, in short, an efficient aperient and febrifuge, and makes an exceedingly pleasant and refreshing beverage.

PRICES. THIS SALINE IS SUPPLIED IN BULK AT

1s. 6d. per pound; 1s. 5d. per pound for 14 pounds; 1s. 4d. per pound for 112 pounds; or in ½-pound bottles (to retail at 1s. 6d.) 11s. per doz.

With or without Labels. It is supplied also on the same terms with A. & H.'s own Labels and Wrappers ready for Retail Sale. SAMPLES FREE ON APPLICATION.

MANUFACTURED BY

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PERFECTION OF FRUIT BEVERAGES

THE HOLYWELL FRUIT CHAMPAGNES

Are guaranteed prepared from Fruit only, no Essence or Compounds whatever being used, and entirely free of Spirit.

They combine in a high degree all the refreshing, nutritive, and other properties of their respective fruits, producing delicious, cooling, and refreshing Summer Beverages for family use, suitable for ball-room or supper party. They embrace Grape, Orange, Pineapple, Cherry, Raspberry, &c.

Special Export Terms. Sold by Grocers, &c.

Wholesale of CAMERON & Co.. 25, Holywell Row, Finsbury

WRIGHT'S LIQUOR CARBONIS DETERGENS

See Testimonials of entire Medical Press and from leading Dermatologists.

The Practitioner of September, 1881, reports a lecture entitled "Recent Advances in the Therapeutics of Diseases of the Skin," by W. A. JAMIESON, Esq., M.D., F.R.C.P. Ed. The following is an abstract therefrom:—"Itching, which owes its origin to too slow a current of blood, of which the most typical example is that seen in *Eczema* connected with varicose veins of the leg—but to the same category also many examples of Pruritus Scroti, Labiorum and Ani may be referred—is best relieved by careful flannel bandaging, well applied suspensory bandages, and laxative salts or mineral waters, which unload the rectal veins by freeing the portal circulation, combined locally with *weak tarry lotions*, one of the best of which is *Wright's Liquor Carbonis Detergens*, a well made *alcoholic solution of Coal Tar*, suitably diluted."

From the *Lancet*, Dec. 22, 1866. "In our hands it has been a most effective agent in skin diseases, especially of the chronic eczematous class; and one case of psoriasis, which had resisted all other kinds of treatment, speedily got well under the application of the *Liquor Carbonis Detergens*. We esteem it a very valuable addition to our list of skin remedies."

From the *Medical Times and Gazette*, January 19, 1867. "We have more than once called attention to the value of this remedy in chronic eczema."

British Medical Journal, April 1, 1882:—"*Wright's Liquor Carbonis Detergens*. This is by no means a new preparation; for it has been in extensive use for many years. It is an alcoholic solution of coal tar, and is disinfectant of considerable value. Medicinally, it is often used for the destruction of pediculi, and as an external application in eczema, psoriasis, and other skin diseases."

Proprietors: W. V. WRIGHT & CO. Southwark Street, LONDON.

A FEW OF THE MANY SPECIALITIES INTRODUCED BY

BOURNE, JOHNSON & LATIMER

10 PER CENT. DISCOUNT FOR CASH.

Absorbent Cotton Wool. Per lb. 2/6.

Areca Nut Tooth Paste. 12 Sixpenny size, in Counter Box, per doz., 4/-; 6 One Shilling size, 8/-

Bathing Caps (Circular Shape). Drab waterproof cloth, 9/-; Cheek ditto, 12/-; Oiled Silk ditto, 16/- per doz.

Beetle Powder. In Tin Dredgers, to retail at 3d. and 6d. each. One or three doz. in Counter Box, 2/-, 4/- per doz.

Benzine (Perfumed). Removes grease spots, takes away thumb marks from books, &c., makes old kid gloves equal to new, cleans artists' brushes, destroys vermin in domestic animals, &c., 4/- and 8/- per doz.

Cachou Lozenges. A 2 oz. Vitrified Tin Box filled with Cachous, 4/- per doz.; to retail at 6d. or 1/-

Camel Hair Pencils. 1 gross assorted in a show case containing Duck, Goose, and extra Goose, 4/6; Ditto, on sticks, 7/- per gross.

Cherry Tooth Paste. 12 Sixpenny size, in Counter Box, 4/-; 6 One Shilling size, 8/- per doz.

Eye Shades (Reading). Self-adjusting and ventilating Very light, 6/- per doz.; to sell at 1/-

Feeding Bottles. 22 patterns. Send for a detailed price list.

Floating Light (Tin). With Reflecting Float. In boxes containing 60 Lights, 4/-; 120 Lights, 8/- per doz. Only needs an introduction to create a demand.

Fly Paper. 1/9 per 100; 16/- per 1000. In Sixpenny Books, 3/6 per doz.

Folding Boxes. On the American principle, for Dispensing or for Proprietary Goods, 2 oz., 4/6; 3 oz., 5/-; 4 oz., 5/-; 6 oz., 5/6; 8 oz., 6/-; 10 oz., 6/6; 12 oz., 7/-; 16 oz., 7/6; 20 oz., 8/- per gross.

Glass Pots. Opaque, for Vaseline, Cold Cream, &c. Opal, ¼ oz., 1/5; ½ oz., 1/6; ¾ oz., 1/8: 1 oz., 1/10; 1½ oz., 2/-; 2 oz., 2/3; 3 oz., 2/9; 4 oz., 3/6 per doz. Opaque blue, 2d. per doz. extra.

Inexhaustible Salts. A Watch Shape Bottle filled with strong Ammonia, each in a box, 7/-, 10/- per doz.

Inhaler (New Pattern). The Universal (Earthenware), to hold Hot Water, with burnt-in directions for use, with glass tubes, 18/- per doz.

Insect Powders. Insect Powder, 2/- per lb. Ditto, in Bottles, 2/-, 4/-, 8/- per doz. Ditto, with Pepper Castor top, 4/- per doz. Ditto, in Tin Apparatus, with piston blower, 8/- per doz.

Insect Powder Boxes.

	Paper.	Tin.
One Penny size	per gross 2/- ..	2/6
Threepenny size	,, 3/6 ..	5/-
Sixpenny ,, ...	,, 5/- ..	8/-
One Shilling ,, ...	,, 8/- ..	10/-

With Rotary tops, per gross, 6d. size, 9/-; 1/- size, 12/-
Bellows, with piston blower .. .. 5/6 per doz.

Medicated Japanese "Curl" Paper. (As Soft as Silk). 500 Sheets in a packet, 4/- per doz.

Paper. Demy size, specially prepared for Druggists' use. White, 8/6; Fast Blue, 10/6 per ream.

Parchment Paper.
Very thin. Superior to Wax Papers for Wrapping Greasy Articles, or for Cold Cream Pots; and a quarter of the price, 1/- per quire. Cut to size for 1 lb., 2 lb., 4 lb. pots. Per doz. packets of 3 doz., 4/-, 6/-, 8/- doz.

Perfume or Spirit Flasks. Nickel plated top. Cut Glass, 10/6 per doz.

Pill Coater, "Simple." (SYMES'). For coating small quantities of Pills with ease and perfection, 4/6 each.

Saline Bottles (with Plug Stoppers). Lamplough's size 18/-; Eno's 18/- per gross. Handsome Wrappers for ditto 7/6; Labels 1/6 per 100.

Seat Cushions (Waterproof). A *sine qua non* for travellers. Folds up in a small compass for the pocket, 13/-, 21/- per doz.

"Sparadrap Agglutinatif" (French Sticking Plaster). Always soft and pliable. Does not irritate the skin. Will adhere to a fresh wound. Contains no resin or turpentine. Does not discolour, 10d. per yard.

Sponge Bags (Check Waterproof).
Nos. 1 2 3 4 5 6 7 8
6/6 8/- 9/6 11/6 13/- 15/- 18/- 20/- per doz.
Ditto, with pocket, per doz. 21/-
Brighton shape, with nickel fastenings, per doz. 18/-, 21/-, 24/-

Sponges (Honeycomb or Turkey). A Revolution in the Sponge Trade. 12 on a card, per doz., to sell at 1d., 8d.; 2d., 1/4; 3d., 2/-; 4d., 2/8; 6 on a card, per doz., to sell at 6d., 4/-; 1/-, 8/-; 1/6, 12/-; 2/-, 16/-; 2/6, 20/-; 3/6, 28/-; 3 on a card, per doz., to sell at 5/-, 40/-; 6/-, 48/-; 7/-, 54/-; 8/-, 64/-; 10/-, 80/-

Stopper Loosener, Boxwood, to fit any size Stopper, from a smelling bottle to a quart size, 1/- each.

Teething Pads (Agate). Real Stone, on card of 6, 9/- per doz.

Teething Pad (Musical). 1 doz. on a show card, 4/- per doz.

"The Three Graces." (Faith, Hope and Charity). A New One Shilling Perfume, neatly put up in boxes, containing one of each to form a set, with Patent Sprinkler, 8/-; Two Shilling size, 15/- per doz.

Tooth Paste. Cherry, 4/-, 8/-; Areca, 4/-, 8/- per doz.

Tube Brush. New pattern. The Brush is in the centre of the wire, 4/6 per gross.

Tube Cleaner. Patent Wire. Marshall's Patent. All metal, on a card of 2 doz., 1/6 per doz. Also in boxes containing 1 gross, to retail at 1d., 9/-

Vaccination Shield (COWAN'S). The original. For protecting the child's arm after Vaccination. Reduced prices, 3/3, 6/6, 13/- per doz.; sell at 6d., 1/-, 2/-

Vagina Syringes. Dr. ROWE'S, with glass mounts, white balls, 18/-; ditto, green balls, 21/-; Dr. ROWE'S, with elastic gum mounts, green balls, 21/- and 24/-; ditto, ditto, white balls, 14/- per doz.

Vials. Packed in wooden boxes containing 1 gross, for safety in transit and for convenience in storage. ½ oz., 4/-; 1 oz., 5/-; 1½ oz., 6/-; 2 oz., 7/- Special quotation for 50 or 100 gross lots.

Wholesale and Export Druggists' Sundriesmen,

35, CASTLE STREET, HOLBORN, E.C.

FULLY ILLUSTRATED PRICE LIST ON APPLICATION.

THE EFFECT OF ALTITUDE ON THE ALKALOID OF RED BARK.

BY J. E. HOWARD, F.R.S.

I beg to forward the enclosed published communication from Dr. Trimen, which will interest many of your readers and sustain the character of your Journal as the best repertory of information on the important subjects of which it treats.

It gives me pleasure to see that "the relationship of the alkaloids" is brought under notice in Dr. Trimen's letter. It is long since I worked at this in conjunction with Dr. Herapath, and much of the information then published is probably forgotten; and much that was inferred relative to the manner in which the molecules appear to be built up in nature (bearing on the possibility or otherwise of the artificial production of quinine) remains for further investigation. I can only remark, at present, on the universality of the relationships thus disclosed by the ray of polarized light.

The relationship is this:—

Lævogyrate.	Dextrogyrate.	Feebly Dextrogyrate.
Quinine.	Quinidine.	Quinicine.
Cinchonidine.	Cinchonine.	Cinchonicine.

Dr. Herapath, in his "Researches on the Cinchona Alkaloids" ('Proceedings of the Royal Society,' November, 1857), attempted to demonstrate this relationship on chemical grounds; and even thought that quinine and cinchonidine might be mutually convertible. He observes that "closely as the quinine and cinchonidine salts agree amongst themselves, they differ widely from the quinidine and cinchonine compounds."

In order to confirm the interesting experiments instituted by Dr. Trimen, I selected specimens given me by Dr. Morris, Jamaica, of red bark grown under somewhat similar differences of altitude; that from the lower elevation having (as in India) the best appearance; that from the higher the richer produce. I shall send portions of these to the Museum.

The bark from which the second sample was taken proceeded from trees grown in the parish of Manchester at an elevation of about 2400 feet. This is the lowest elevation at which cinchona bark trees have been cultivated in Jamaica. The trees were between eight and nine years old, growing in a sheltered situation and on a good strong red soil; the mean annual rainfall about 90 inches, and the mean annual temperature about 73° F.

As the elevation is intermediate, so the alkaloids hold a consistently intermediate position between the two samples of Ceylon bark, perhaps with a slight exception as to the amorphous alkaloid. If the circumstances of growth in other respects had been the same as in India, it is probable that the amount of quinine in the Jamaica sample of 6000 feet would have increased at the expense of the amorphous alkaloid. As it is, the Jamaica bark at this elevation scarcely equals expectations, although the botanical samples are very true to type.

Analysis of samples of *Cinchona succirubra*, sent by Drs. Trimen and Morris, at different elevations:—

Elevation above sea level.	Place of growth.	Quinine.	Cinchonidine.	Cinchonine.	Quinidine.	Amorphous.	Total alkaloids.
A. 5500 ft. .	Hakgala	2·06	3·47	0·61	Traces	0·66	6·80
5500 to 6000 . .	Jamaica	1·76	3·17	0·75		0·75	6·43
2400 . . .	Jamaica	1·50	0·86	3·06	0·06	1·13	6·61
B. 1500 ft. .	Peradeniya	0·47	0·05	1·67	0·30	1·06	3·55

The *succirubra* is, however, the wrong sort to cultivate, and (except only as regards the bark *renewed* in McIvor's method) will always be found disappointing. The *shaving* process is incomplete. It is requisite that the bark should be stripped in the wet line of the cambium. The tree then begins *de novo*. An exudation is thrown out from the peeled surface, "like the perspiration from the back of the hand," as McIvor described it to me. The formation is then *radial*, and not concentric (see Fig. 5 and 6 of Plate III. of my 'Quinology'), with abundance of cellular tissue and a consequent complete change in the alkaloids. I have objected to the *succirubra* from an early stage in the culture, but opposite counsels prevailed. The prices obtained for very inferior bark now sent home may perhaps show the planters that it would have been more to their interest to cultivate the better sorts—the *Pata de Gallinazo* introduced together with the *succirubra* by Cross, the *magnifolia* (Uritusinga?), the *robusta*,—known to them but neglected till lately. I have just received an account of the 1882 harvest of bark in Java, from which I learn that 763 bales of all sorts of succirubra bark gave on an average of 28 analyses 1·04 per cent. of quinine; but of this two lots were of "*renewed*" bark, respectively 2·2 and 2·4 per cent., and, deducting these, the percentage falls to 0·94 of quinine. This culture can hardly be profitable for quinine manufacture,* nor yet for pharmaceutical purposes, as I have shown first in my 'Quinologia,' 1862, and many times since, that the "red bark" contains a *distinctly noxious ingredient* not found in the barks better adapted for medicinal use.

The tests of the inferior Calisaya, Schukraft, Javanica and Anglica, are about 1 per cent. of quinine. Surely this cannot pay *at present*; but, even if it does, how will such plantations compete in future with the immense cultivation commencing elsewhere. Of course in Java the redeeming feature is the *Ledgeriana*; the *officinalis* seems also to promise well.

The result of these trials seems to prove that elevation above the sea level is far more important than all the other factors in the problem, but why this should be so, I confess I do not see. The true home of the Cinchona is in the clouds; direct scorching sunlight is fatal.

I am at this moment observing with interest the effect of light on some Cinchonas. In the early part of last year I sowed, almost at the same time, seed of the true *Ledgeriana* from the Yarrow estate in Ceylon, derived from trees yielding from 7 to 12 per cent. of quinine, and also seed kindly given me by Mr. Christy, from Bolivia, of the best kinds there cultivated. I watched with interest the development of the young plants, which for a considerable time entirely resembled each other—only that I found the *Ledgeriana* the more sensitive to surrounding influences. After some months' growth the Bolivian seed began to develop the characteristics

* See the Blue Book of Indian Government (June 18, 1866, p. 134), in which, after analysis of the first parcels sent home, I observed the great preponderance of cinchonidine, and notified to the Indian Government "This difficulty must be looked steadily in the face, and I would suggest that it may be obviated, either by a change being wrought in the opinion of the medical world as to the value of cinchonidine as a medicine, or by the plant being encouraged to produce quinine instead of cinchonidine." This latter Mr. McIvor afterwards succeeded in effecting by his renewing process. The Government also acted on my former suggestion.

of the *verde*, *morada* and the *rubra venada* of Bolivia; whilst the *Ledgeriana* showed features of difference, though at the same time of close affinity. This was shown, amongst other things, by the rich velvety surface of the leaf, marking the best Calisayas,* as also by a delicate fringe of hair at the edges of the leaves. But now that the more flourishing plants are some ten inches in height (the *rubra venada*, twenty), further diversities appear. The leaves of the *Ledgeriana* turn *red* in fading, which is said by Mr. Ledger to be characteristic of his "rojo" (*roxo*) at the flowering season, from whence it derives its name "*red*."

They are more delicately formed than the others I have named, and more easily damaged by direct sunlight. As night approaches, the top leaves gradually change their position, approaching each other so as in some cases almost to fold together. This is well shown in a fine plant of true *Ledgeriana* which I have from Darjeeling, and also in the more flourishing of my plants from Ceylon. I do not notice the same in the *verde* from Mr. Christy's Bolivian seed, of which the leaves are more robust, but the above features are not *confined* to the "rojo."

These peculiarities would scarcely be seen unless the plants were well developed under glass, but once observed it is impossible to forget or to confuse these rich varieties of Calisaya (which I described and figured as such from well ascertained specimens sent by M. Moens) with the plant described and figured by Dr. Trimen as "*C. Ledgeriana*, Moens," and which I should call *C. micrantha*, var. *Calisayoides*. Dr. Trimen had not the opportunity of comparing the plates drawn by Fitch, in my 'Quinology,' with those in the *Journal of Botany*; but the distinction is most evident, as I have endeavoured to demonstrate to the Linnean Society. My figures of *C. Calisaya*, var. *Ledgeriana*, are from trees yielding respectively (Pl. IV.) 9·06, (Pl. V.) 9·90, and (Pl. VI.) 9·97 per cent. of quinine and the fruit-bearing branch 10·90 (same plate). See the account of my herbarium, pp. 58–66.

The "rojo" (*roxo*), or *C. Calisaya*, var. *Ledgeriana*, is the queen of all the Cinchonas; but certainly possesses a delicate organization which makes the cultivation difficult. The "verde," as being a quick growing tree, flourishing at lower elevation, is found in Bolivia more profitable to cultivate than the "morada," although the latter is richer in percentage of quinine. I do not think that the *Ledgeriana* is cultivated in Bolivia, but another sort of "rojo" is extensively planted in Coroico, in the Yungas of Bolivia. "This is not so good as the Caupolican rojo." It is the *Colorada naranjada*, or *orange peel red*, only known to me by the bark, which has a character peculiarly its own. The bark of the *Ledgeriana* is most characteristic. It is thick and composed almost entirely of cellular tissue; quite contrasted with that of the "verde," which bears the stamp of more vigorous growth and has a more fibrous structure and less alkaloid. This last has for many years been familiar to me in importation from South America.

But I must defer for the present any further remarks.

From a letter from Mr. Ledger, February 7, 1881:—

"I repeatedly used to joke poor Manuel when he used at first to tell me the trees from which the thick, heavy slabs of bark (in fact the *Rojo*) came from had white flowers. The *Rojo* from Coroico and in South Yungas, though with purple red leaves underside [the *morada*], are nothing to be compared with the *Rojo* of Caupolican and Apolobamba. The *Rojo* or *Ledgeriana* is very little known in Bolivia even. According to Manuel this tree is never met with in *Manchas* (patches) like the other classes of Cinchona. It is found by itself here and there. With all cascarilleros from Pelechuco a '*slab*' *of Calisaya rojo* means *unsurpassable*, and is meant to say, where that is, all the rest is good or Calisaya."

* See Weddell's 'Histoire.'

(*From Ceylon Observer, April* 9, 1883.)

THE EFFECT OF ALTITUDE ON THE ALKALOIDS OF RED BARK.

Sir,—Everything that may throw any light upon the relationships of the cinchona alkaloids, or on the causes which influence their production, is of much interest; it also has a practical value to cultivators. I therefore no longer delay in making public the results of two remarkable analyses of Ceylon *C. succirubra*.

With the object of ascertaining the effects of altitude on the alkaloid production of this species, I, towards the end of last year, barked two trees growing respectively at elevations of 5500 (Hakgala) and 1500 (Peradeniya), a difference of 4000 feet. The trees were, I have every reason to believe, of common origin: both being, in all probability, raised from the original seed collected in South America by Dr. Spruce, and planted out in the midst of other trees, in or about 1863. They were therefore about nineteen years old reckoned from the planting, and both had grown up under fairly similar conditions, excepting as regards climate. Their growth, however, had been very different. The tree at Hakgala was one of the largest there, 37 feet high to the point where the stem was but 1 inch in diameter and 37 inches in girth at the base lessening to 24 inches at 5 feet from the ground. It afforded 25 lbs. of dry bark (77 lbs. of wet), and the sample sent home was large quill 18 inches long with a "brown coat." On the other hand, the Peradeniya tree, though not far off the other in height, being drawn up by the large trees around, girthed only about 20 inches near the ground and yielded about 7 lbs. of dry bark (21 of wet). The sample of small quill sent home was described as having a "grey coat."

It is to my friend, Mr. J. E. Howard, who is ever most liberal in helping to advance our knowledge of quinology, that I am indebted for the following comparative analysis of these two samples. He is himself much interested in the result, and we may, I believe, expect some observations upon it from his pen:—

	Quinine sulphate.	Quinine.	Cinchonidine.	Cinchonine.	Quinidine.	Amorphous.	Total alkaloids.
A. Large quill grown at Hakgala, 5500 ft. .	2·75	2·06	3·47	0·61	Trace	0·66	6·80
B. Small quill grown at Peradeniya, 1500 ft. . . .	0·62	0·47	0·05	1·67	0·30	1·06	3·55

A comparison of these very different analyses suggests many observations. And at first sight we cannot but be struck with the influence for good of elevation in the production of the alkaloids as a whole, nearly double as much being produced in the higher locality. Mr. Howard remarks that as far as the *appearance* of the bark is concerned the contrary was the case, that from the low elevation being the "more attractive to those who judge merely by the eye."

The large amount of quinine in analysis A is also noteworthy in red bark from a tree nearly twenty years old, as showing that there is no necessary diminution of that alkaloid after eight or nine years, as Mr. Broughton was led to believe.

It is however as regards the proportions of the alka-

loids that the comparison will be found most instructive. In A we have of quinine over 2 per cent., and of cinchonidine nearly 3½ per cent., whilst there is but 0·61 of cinchonine and a mere trace of quinidine: in B the change is very remarkable: quinine has sunk to less than ⅓ per cent., and cinchonidine to little more than a trace (0·05 per cent.), whilst on the other hand, cinchonine has increased to 1·67 per cent.—that is, about two and a half times as much as in A—and there is also an appreciable amount (0·30 per cent.) of quinidine. It has been remarked* that the natural or physiological relationship of the four principal alkaloids of cinchona bark is not expressed by their chemical constitution and terminology. Quinine and quinidine are, as is well known, isomeric chemical bodies, *i.e.*, both have the same empiric formula of composition, $C_{20}H_{24}N_2O_2$, and cinchonine and cinchonidine are similarly related, their common formula being $C_{20}H_{24}N_2O$. But in nature it would appear that the pairs are differently composed, and it is customary to find associated in the tissues, quinine and cinchonidine and cinchonine and quinidine and not the isomeric couples. It is indeed highly probable that, under conditions of oxidation and deoxidation at present not understood, the units in each of these naturally associated pairs are mutually convertible. The analyses before us bring out this association in a very marked manner.

The relationship of the alkaloids, to which attention is here called, is also indicated by the action of their solutions on a ray of polarized light. Quinine and cinchonidine deflect this to the left and are lævo-rotatory, whilst cinchonine and quinidine have a right hand or dextro-rotatory action.

As to the causes which in the case before us have led to the disappearance of the quinine and cinchonidine in the low-grown bark, and their partial substitution by cinchonine and quinidine we have little to guide us, but the fact is a very important one as bearing on the cultivation of red bark at low elevations. A similar substitution has been recorded before in old trees, but age alone is seen, by analysis A, to be an insufficient cause. It is probable that temperature is the more important factor, and support is given to this by the remarkable case recorded by Broughton,† of the reversed action in *C. peruviana*. This species, as grown at Neddivuttum, is remarkable for affording cinchonine in large quantity —in the experiment recorded 3·84 per cent.—and absolutely no quinine; when grown, however, at the higher elevation of Dodabetta, the cinchonine was greatly diminished, whilst quinine was present to the amount of 0·79 per cent. I am, sir, yours faithfully,

HENRY TRIMEN.

Peradeniya, April 5, 1883.

* Mr. Howard especially called attention to this so long ago as 1866 (see 'Proc. Bot. Congress in London,' p. 198).

† 'Report to Government of Madras,' September 26, 1871.

NOTE ON A SAMPLE OF "CRETA PRÆPARATA."

BY F. HARRIS ALCOCK.

A short time ago I was requested by a friend who is engaged in one of the large dispensing establishments of the West-end to examine a specimen of what had been described to him as a special brand of the above-mentioned article.

It seems that his suspicions were aroused by the fineness of the cones and their white appearance, and in order to satisfy himself on their composition he wished me to subject them to an examination, and let him know the result, which was as follows:—

Physical Characters.—In cones of almost equal size, each weighing (average of fifteen) 70 grains and measuring 1⅛ inch in height and about ⅞ inch diameter at the base; much lighter and whiter than the British Pharmacopœia variety and having a satiny touch, free from grittiness. Under the microscope, a little of the powder scraped off one of the pieces was seen to consist of very small uniform prismatic crystals when viewed with a ¼-inch objective, whereas a sample prepared by elutriation as officially directed was found to be amorphous when similarly examined.

Chemical Characters.—As I had some weeks before had occasion to use some "blackboard chalk" for an experiment (thinking it to be carbonate of calcium) and finding that it only slightly effervesced with diluted hydrochloric acid, and that it was chiefly sulphate of calcium, I suspected the same substitution in the substance under examination. This proved to be the case, for when diluted hydrochloric acid was added to it a little effervescence resulted, but not enough for the quantity used to indicate presence of carbonate of calcium only; on the application of a little heat a perfect solution was obtained, and this gave evidence of the calcium when the usual tests for the compounds of that metal were applied. When, to a similar solution, chloride of barium was added a copious precipitate fell, which corresponded in every particular to the usual behaviour of the sulphate radical. On further examination of the substance it proved to be chiefly a mixture of calcium sulphate ($CaSO_4,2H_2O$) with calcium carbonate.

To obtain an idea as to the amount of sulphate present I made three quantitative experiments, the mean of which gave 67·016 per cent. (calculated as $CaSO_4,2H_2O$), and the amount of the carbonic anhydride which was obtained from a given weight of the substance by the usual means recommended for estimating that gas showed the presence of 32·379 per cent. calcium carbonate, the rest being a trace of iron, silica and chloride.

My object in writing this is to call the attention of pharmacists to this matter, to enable them to examine their specimens to see if they are genuine and free from such an impurity.

Of course for cosmetic purposes gypsum is largely used, but not so much as an internal remedial agent, and consequently it might prove objectionable rather than otherwise when used in such cases as when true "creta præparata" would be required.

I am informed that when tooth powders containing chalk and soap, etc., are made up with the above material, the usual frothing does not take place and altogether a disagreeable result is obtained.

PICRIC ACID AS A TEST FOR ALBUMEN AND SUGAR IN THE URINE.*

BY GEORGE JOHNSON, M.D., F.R.S.,

Physician to King's College Hospital and Professor of Clinical Medicine in King's College

During a period of about two years, I have been in the habit of using picric acid as a test for albumen in the urine. I was induced to employ this test by my son, G. Stillingfleet Johnson, one of the Demonstrators of Chemistry at King's College, who, while working at the compounds of albumen with the mineral acids, the results of which he published in the *Journal of the Chemical Society* (August, 1874), found that picric acid

* Paper read before the Clinical Society, March 9, 1883. Communicated by the Author.

caused coagulation in all the acid compounds of albumen; and he therefore suggested that it might be found a valuable test for albumen in the urine. At that time, we were not aware that it had ever been employed as a test for albumen; and in a communication to the *Lancet* (November 4, 1882), I spoke of it as a new test; but, a few days after the publication of my paper, I chanced to come upon a leading article in the *Medical Times and Gazette* (vol. ii. for 1874, p. 366), in which picric acid is mentioned as having been recommended as a test for albumen by a French physician, M. Galippe. There is, therefore, no novelty in the suggestion; but, so far as I can learn, the true value of the test has not hitherto been appreciated, and therefore it has not come into general use. The test may be used in the form of a saturated aqueous solution, or in the form of powder or crystals. The aqueous solution is most suitable for home use, while the powder or crystals may conveniently be carried in a urinary pocket test-case.* A saturated aqueous solution may be quickly made by dissolving the dry acid in distilled or rain water in the proportion of seven grains to the fluid-ounce; a portion of the acid will crystallize out on cooling, leaving a transparent yellow supernatant liquid. This solution, being added to an equal volume of albuminous urine in a test-tube, immediately coagulates the albumen. The coagulated picrate of albumen is soluble in alkalies; if, therefore, the urine be highly alkaline, it must be acidulated by a vegetable or a mineral acid before adding the picric acid solution. In my numerous testings for albumen with picric acid, I have not once found it necessary to acidulate the urine. The picric acid solution is itself sufficiently acid to dissolve the phosphatic sediment which results from boiling a neutral or alkaline specimen of urine.

To detect a very minute quantity of albumen, the following method is the best. Into a test-tube about six inches long, the urine is poured to within two inches of the top; then, the tube being held in a slanting position, about an inch of the picric acid solution is gently poured on the surface of the urine, where, in consequence of its low specific gravity (1003), it only partly mixes with the upper layer of the urine; and, as far as the yellow colour of the picric solution extends, there will be more or less turbidity from coagulated albumen, contrasting with the pellucid unstained urine below. If, then, the tube be placed in a stand, the coagulated albumen will gradually subside, and form a delicate horizontal film at the junction of the coloured and the unstained stratum of urine; the yellow liquid above and the uncoloured urine below being quite free from turbidity. If the urine should be turbid with urates, it must be cleared by heat before the addition of the picric acid solution.

As a result of numerous careful observations, I have arrived at the conclusion that picric acid applied in this way is a more delicate, and therefore more trustworthy, test for albumen than nitric acid in cold urine, whether the latter be employed by the method of dropping the acid into the cold urine or by pouring the urine on the acid previously placed in the tube. The simplest and most satisfactory mode of comparing the two tests as regards their relative delicacy, is to dilute a specimen of albuminous urine until one or the other test fails to act; and it will be found that the picric acid solution shows the presence of albumen in a specimen diluted considerably beyond the point at which the nitric acid fails to give any indication. The picric acid, too, often causes an immediate albuminous opalescence in specimens in which nitric acid only slowly, and after an interval of some minutes, gives a similar, but sometimes a doubtful, indication.

It scarcely need be insisted on that, for example, during convalescence from acute albuminuria, it is of the greatest practical importance to be assured that no trace of albumen remains.

* Such a case has been made for me by Hawksley, 357, Oxford Street.

Here it may be well to mention that the albuminous opalescence with picric acid which always occurs immediately, if at all, may readily be distinguished from the coarse granular particles of urate of soda, which, after a delay of some minutes, sometimes result from the acidity of the picric solution. These granular masses of urate, sometimes mixed with crystals of free uric acid, quickly fall to the bottom of the test-tube, and carry with them so much of the picric colouring matter, that, when placed under the microscope, they are so opaque as to appear almost black.

In testing with the powder or crystals, as much as is equal in bulk to a peppercorn may be shaken up in a test-tube, with a column of urine about an inch in height. As the powder dissolves, the urine becomes turbid with coagulated albumen. The object is to add as much of the test as the urine will dissolve, and no more. The solution of the picric acid in the urine, and the coagulation of the albumen, are quickened by heating the tube over a spirit-lamp or a candle, or by immersing the tube in hot water.

Another convenient mode of using the powder or crystals is to add fifteen or twenty minims of water to the peppercorn bulk of the acid in the tube, and quicken the solution by the application of heat; an equal bulk of urine is then gradually added to the hot solution, when albumen, if present, is at once detected.

The value of picric acid, as a test for clinical use, is much increased by the fact that, when boiled with a solution of potash, it forms a most delicate test for glucose. As I have stated, in a letter which I addressed to the *Lancet* (November 18, 1882), I stumbled upon this fact by adding some picric acid solution to a boiling specimen of saccharine urine which had previously been mixed with half its volume of liquor potassæ. I was at that time not aware of the fact, that the reaction of picric acid with grape sugar had been observed by Braun, a German chemist, nearly twenty years ago. I am indebted to Dr. Pavy for a reference to Braun's paper ("Ueber die Umwandlung der Pikrinsäure in Pikramminsäure, und ueber die Nachweisung der Trauben-Zucker." C. D. Braun.—*Zeitschrift fur Chemie*, 1865). In this paper, it is shown that grape-sugar, when boiled with picric acid and potash, reduces the yellow picric acid to the deep red picramic acid, the depth of colour depending on the amount of sugar present. I am not aware that hitherto any attempt has been made to utilize this as a qualitative clinical test for sugar in the urine, or as a means of accurately estimating the amount of sugar in a saccharine solution. I trust, however, to be able to establish its value for both purposes.

Take a fluid drachm of a solution of grape-sugar, in the proportion of a grain to the fluid ounce; mix it with half a drachm of liquor potassæ (B.P.), and ten minims of a saturated solution of picric acid; and make up the mixture to four drachms with distilled water. The mixture is conveniently made in a boiling tube, ten inches long and three-fourths of an inch in diameter, which may be marked below at the height of two and four drachms. With a long boiling tube, there is little risk of the liquid boiling over; and, the steam, condensing in the upper cool part of the tube, flows back as liquid, so that there is little loss by evaporation. The liquid is now raised to the boiling point, and the boiling is continued for sixty seconds by the watch, so as to insure the complete reaction between the sugar and the picric acid. During the process of boiling, the pale yellow colour of the liquid is changed to a beautiful claret red.

The liquid having been cooled, by cautiously immersing the tube in cold water, and it having been ascertained that its level is that of the four-drachm mark on the tube, or, if below the mark, it having been brought up to it by the addition of distilled water, the colour is that which results from decomposition of picric acid, by a grain of sugar to the ounce, four times diluted; in other words, it indicates one-fourth of a grain of sugar to the ounce; and this colour is a convenient standard for comparison

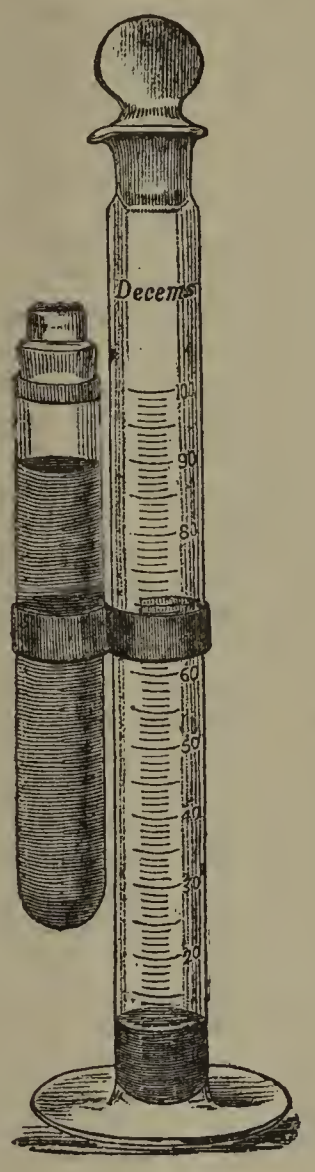
in making a volumetric analysis. The picramic acid solution, however, on exposure to light, even for a few hours, becomes paler; but the colour may be exactly imitated by a solution of ferric acetate, with a slight excess of acetic acid and an excess of ferric chloride. The iron solution, we have found to retain its colour unchanged for a fortnight, even when exposed to a strong light; and we expect that, when light is excluded, it may be kept for an indefinite period; and it is, therefore, a convenient standard for comparison.*

If, now, a drachm of a solution of grape-sugar, containing two grains to the ounce, be mixed with the same quantity of liquor potassæ (half a drachm) as before, but with double the amount of picric acid (*i.e.*, twenty minims), and made up to four drachms in the boiling tube, the result of boiling the mixture as before for sixty seconds, will be the production of a much darker colour than when the one-grain solution was acted upon; but if now the dark liquid be diluted with its own volume of water, the colour will be the same as that of the one-grain solution.

The dilution is accurately done in a stoppered tube, twelve inches long and three quarters of an inch in diameter, graduated into $\frac{1}{10}$ and $\frac{1}{100}$ equal divisions. By the side of this tube, and held in position by an S-shaped band of metal, is a stoppered tube of equal diameter, and about six inches long, containing the standard iron solution.†

Sufficient of the dark saccharine liquid to be analysed is poured in to occupy exactly ten divisions of the graduated tube. Distilled water is then added cautiously, until the colour approaches that of the standard. The level of the liquid is then read off and noted. A more exact comparison of the saccharine liquid with the standard is made by pouring into a flat-bottomed colourless tube, about six inches long and an inch in diameter, as much of the standard as will form a column of liquid about an inch in height, and an exactly equal column of the saccharine liquid in a precisely similar tube. The operator then looks down, through both tubes at once, one being held in each hand, upon the surface of a white porcelain slab, or a piece of white paper. In this way a slight difference of tint is readily recognized, and if the liquid to be analysed be found to be darker than the standard, it is returned to the graduated tube, and diluted until the two liquids are found to be identical in colour, when the final reading is taken. The saccharine liquid having been diluted four times before it was boiled, a colour equal to that of the quarter-grain standard would indicate one grain of sugar per fluid ounce. If further dilution were required—say from ten to twenty divisions—the proportion of sugar would be two grains per ounce, and so on to thirty or forty or upwards, or to intermediate divisions. Thus dilution from ten to thirty-five divisions would indicate 3·5 grains of sugar per ounce.

We have found, by experiment, that ten minims of a cold saturated solution of picric acid are rather more than sufficient for decomposition by one drachm of a solution of grape sugar in the proportion of one grain to the ounce. A drachm of the solution would, of course, contain one eighth of a grain of sugar. In making an analysis, the



The picro-saccharimeter, as described in the text. The shading of the side tube indicates the ferric acetate standard. The darker shading at the bottom of the graduated tube shows the saccharine fluid, darkened by boiling with picric acid and potash, and occupying ten divisions before dilution.

picric acid must be added in proportion to the amount of sugar. If the proportion of sugar be as high as six grains per ounce, a drachm of the picric acid solution will be required. If the proportion of sugar be higher than this, the saccharine fluid should be diluted with distilled water in a definite proportion before commencing the analysis, and the product of the analysis of the diluted fluid is then to be multiplied by the degree of dilution—two, five, or ten, as the case may be, to which the original liquid has been subjected.

Distilled water, or clear rain-water, should be used for diluting. Hard water, containing salts of lime, is rendered turbid by the carbonate of lime precipitated by mixture with caustic potash, and any turbidity in the liquid interferes with the estimation of the depth of colour. In testing undiluted urine, a slight turbidity often results from separation of phosphates by the potash. This turbidity may be removed by allowing the phosphates to form a sediment, or more speedily by filtration. When a highly saccharine liquid is diluted five or ten times before mixture with the testing materials, no phosphatic turbidity occurs. In making a volumetric analysis, care must, of course, be taken that the measurements and dilutions are accurately made.

The preliminary dilution of a strongly saccharine specimen may be made in the graduated tube; or into a flask graduated to contain fifty cubic centimetres; five or ten cubic centimetres of the saccharine liquid may be delivered from a graduated pipette; then the flask being filled up to the graduation with distilled water, the dilution will be ten times with five cubic centimetres, and

* I hope and believe that our friends and fellow-workers, the pharmaceutical chemists, will prepare standard sugar solutions, and also the ferric acetate standard for those who require them. We have made the ferric acetate by adding ferric chloride to ammonium acetate. It is of primary importance that the standard be correct.

[We have been kindly supplied with the following form for a "standard sugar solution," which is, we believe, due to the suggestion of Mr. G. Stillingfleet Johnson.—Ed. P. J.

Liq. ferri perchlor. fort.	℥j.
Liq. ammon. acet.	℥iv.
Acid. acet. glacial.	℥iv.
Aq. dest.	ad ℥iiss.

The colour of this is equal to a quarter of a grain of grape sugar to the ounce. Of course this wants checking every time it is made.]

† The picro-saccharimeter was made for me by E. Cetti, 36, Broke Street, Holborn, E.C.

five times with ten cubic centimetres of the liquid to be analysed.

Another important point is that, while the amount of potash remains the same, the picric acid must be in proportion to the amount of sugar in solution. It has already been mentioned that ten minims of the picric acid solution are more than equal to one-eighth of a grain of glucose, which is the amount contained in one drachm of a solution, in the proportion of a grain to a fluid ounce. A slight or even a considerable excess of picric acid does not appreciably affect the colour of the picramic acid, while a deficiency would, of course, lead to an underestimate of the amount of sugar. If an analysis with thirty minims of picric acid solution indicate, say, from three to four grains of sugar, it is probable that some sugar has been left undecomposed, and a second analysis, with a larger proportion of picric acid, might therefore give a higher and a more correct result. If, on the other hand, a second analysis, with a larger proportion of picric acid, give an identical result, we may feel certain that the whole of the sugar has been decomposed, and the amount indicated by the resulting picramic coloration. In any case, when the amount of sugar indicated is less than would suffice to react upon the amount of picric acid employed, the result may be relied upon as correct.

The presence of albumen, even in large amount, has but little influence on the picric acid test for sugar. In illustration of this, the following experiments will suffice. A specimen of urine, normal as regards the amount of saccharine or saccharoid material, but containing a large amount of albumen, was boiled with picric acid and potash with sufficient water to dilute the urine by its own volume of liquid. A second portion was treated in the same way after the separation of the albumen by boiling and filtration, and the first specimen gave a darker tint than the second to a degree that might be considered to indicate one-tenth of a grain of sugar per ounce. Another portion of the urine was decolorized by repeated filtering through charcoal; and, of this, one specimen was tested while it retained its albumen, another after the separation of the albumen — the result being that both yielded identical tints of colour, and this was very slightly paler than that of the specimen which was tested after having been deprived of its albumen without previous decolorization by charcoal. The explanation is, that pure albumen has no reducing influence on picric acid when boiled with dilute potash, such as is used in testing for sugar; but with seralbumen, as with white of egg, there is associated a colouring matter which is partly separated by filtering off the coagulated albumen, and entirely removed by repeated filtering through charcoal. The colouring matter in question has a reducing influence on picric acid, although the colouring matter of normal urine has been found to have none. The coagulated albumen collected on the filter, after being thoroughly washed, gives no red reaction when boiled with picric acid and potash diluted in the same proportion as that employed in testing for sugar. This has been proved by repeated experiments.*

The accuracy of the picric acid method of volumetric sugar analysis has been fully and fairly tested. Our plan has been to compare the results of this process with those obtained by Dr. Pavy's beautiful and accurate ammonio-cupric method. We have analysed the same specimens, many of them albuminous as well as saccharine, by the two processes, my son employing Dr. Pavy's method in the laboratory at King's College, and I the picric acid process at home; and our results are found to be practically identical, the differences being only such as are due to unavoidable slight errors in conducting an experiment. Both methods, in fact, are based upon the same chemical principle—namely, that glucose, when heated with potash in the presence of an oxidizing agent, has a tendency to rob it of its oxygen. In the one process, the reducing action of the sugar is exerted upon an oxide of copper; in the other, on picric acid, A definite weight of sugar reduces, in the one case, a proportional amount of cupric oxide, and in the other an equivalent proportion of picric acid, with resulting picramic acid, and a corresponding measurable intensity of colour.

The proportion of sugar in the specimens analysed has varied from one grain to fifty grains per fluid ounce. The following may be taken as examples of practically identical results.

1.	13·5 grs. per fluid oz.	. .	13·5 grs. per fluid oz.
2.	33 „ „	. .	32 „ „
3.	31·2 „ „	. .	30·5 „ „
4.	36.4 „ „	. .	36 „ „
5.	10.3 „ „	. .	9·5 „ „
6.	1·28 „ „	. .	1 „ „
7.	11·5 „ „	. .	11 „ „
8.	36·4 „ „	. .	36 „ „
9.	2·57 „ „	. .	2·5 „ „
10.	3·1 „ „	. .	2·9 „ „
11.	7·27 „ „	. .	7 „ „
12.	16·8 „ „	. .	16 „ „
13.	48·5 „ „	. .	47·5 „ „
14.	27·7 „ „	. .	27 „ „
15.	48·4 „ „	. .	48 „ „
16.	17·47 „ „	. .	17 „ „
17.	49·6 „ „	. .	49 „ „
18.	9·3 „ „	. .	8·5 „ „
19.	9·9 „ „	. .	10 „ „
20.	6·05 „ „	. .	6 „ „

It will be seen that in the majority of cases, the ammonio-cupric process gives results slightly in excess of the picric acid method. This excess is due to some non-saccharine ingredients in the urine, which reduce cupric oxide, but not picric acid.

During the last three months, I have tested with the picric acid and potash a large number of specimens of normal urine (about 300), with the almost uniform result of a depth of colour indicating the proportion of 0·6 grain of sugar in the fluid ounce, the indications usually varying between the limits 0·5 and 0·7 grain in the fluid ounce. In a considerable number of cases, my son has tested the same specimens by the ammonio-cupric method, with the indication usually of from 0·7 grain to 0·9 grain in the fluid ounce; *i.e.*, an excess of that obtained by picric acid of from 0·1 to 0·3 grain in the fluid ounce.

The following have been the proportions of the various liquids: a drachm of urine, ½ a drachm of liquor potassæ, 10 minims of picric acid solution, made up to 2 drachms with distilled water. The mixture is kept boiling for a minute, and, when cooled, is compared with the standard. The urine having been diluted by its own volume, a depth of colour equal to that of the standard would indicate 0·5 grain of sugar; but in nearly every case I have found it so much darker than the standard, as to require further dilution equal to 0·1 grain before the standard colour is reached, thus giving an indication of 0·6 grain.

So constant is this degree of coloration with normal urine that if, instead of diluting up to 2 drachms, the dilution be carried further by 24 minims, the resulting colour might be taken as an approximation to an exact quarter-grain standard, and, in the absence of a more exact standard, might be used for making an analysis. The question arises—Does normal urine contain as much as 0·6 to 0·7 grain of glucose in the fluid ounce? We are

* A chemical result of boiling albumen with potash, and the question of the formation of alkaline sulphide, was discussed at some length in the columns of the *Lancet* during the months of December and January last. For the final communication from my son, in which he demonstrates that the apparently contradictory results obtained by different observers are explained by the varying proportions of the caustic potash employed, the *Lancet* could not find space, but it is published in the *Chemical News*, February 23, 1883, page 87.

not prepared to assert this without further evidence than we have as yet been able to obtain; but, if it be not glucose which gives these almost identical analytical results with the two processes, it must surely be some nearly allied substance.

There are certain facts connected with the behaviour of this reducing agent so constantly found, and in such constant quantities in normal urine, which point to its saccharine nature. 1. Its reducing effect upon both cupric oxide and picric acid is equal to that which would be exhibited by an equal weight of pure glucose. This is remarkable, since any other substance than glucose or an isomeric sugar would probably reduce more or less either of the picric acid or of the cupric oxide. 2. It is completely destroyed by prolonged ebullition with dilute caustic alkalies. On the other hand, we are unable to assert positively that it is glucose, since it is unfermentable by yeast, and the most careful analyses have failed to produce more than those traces of grape-sugar from normal urine which were obtained by Brücke and Bence Jones ($\frac{1}{50}$ of a grain per fluid ounce). The results of careful analyses of normal urines tend to show that the secretion of the healthy human kidney contains two distinct classes of cupric oxide-reducing substances, viz., (1) such substances as uric acid, etc., which are not destroyed by boiling, with dilute caustic potash; and (2) what may be described as saccharoid bodies which *are* disintegrated by such treatment. Moreover, it appears that picric acid is reduced only by the second, or saccharoid group of normal urinary constituents; for the results of analyses by the ammonio-cupric method of healthy urine which has undergone sufficiently prolonged boiling with dilute potash to completely destroy everything which is capable of reducing picric acid—*i.e.*, everything belonging to group 2, or the saccharoids—invariably show the presence of more or less cupric oxide-reducing substance which has escaped disintegration by the boiling alkali; and on deducting this reduction from the total cupric oxide-reduction effected by the original urine, an indication of (?) glucose is obtained equal to that given by the picric acid method with the original urine.

The results of some such analyses are tabulated below, in which all reduction is expressed in grains of glucose in the fluid ounce.

I. Total indication by picric acid.	II. Total indication by Ammonio-cupric method.	III. Indication by Ammonio-cupric method after boiling with potash.	IV. Difference between II. and III. Saccharoid substance.
gr. per fl. oz.	gr. per fl. oz.	gr. per fl. oz.	gr. per fl. oz.
(1). 0·6	0·909	0·276	0·63
(2). 0·5	0·607	0·09	0·517
(3). 0·35	0·546	0·145	0·401
(4). 0·8	1·245	0·437	0·808

All reductions expressed as grains of glucose per fluid ounce.

These results are explained by the fact that those ingredients of healthy urine which reduce cupric oxide, and are not destroyed by boiling with potash, such as uric acid and urates, have been found to exert no reducing action upon picric acid.

There are at least two undoubted sugars, viz., sorbite and eucalin, which reduce cupric oxide from potassio-cupric tartrate, and are destroyed by boiling with dilute potash, but do not undergo the vinous fermentation under the influence of yeast; and both these sugars are isomeric with glucose. Hence, though the evidence of the indentity of the saccharoid ingredient of normal human urine with glucose is incomplete, it is at least probable from its behaviour and reactions that it may be a true sugar.

I trust that the method of saccharimetry which I have described, will enable every practitioner who has the will, to estimate with ease and accuracy the amount of sugar in any specimen of urine.

ALGIN: A NEW SUBSTANCE OBTAINED FROM SOME OF THE COMMONER SPECIES OF MARINE ALGÆ.*

BY E. C. C. STANFORD, F.C.S.

The utilization of hitherto waste materials presents a large field for chemical investigation, and many important industries have within the last twenty years resulted from such researches.

There are few materials so abundant, so general, and so easily obtained as the commoner kinds of seaweed thrown up on all our coasts, but especially on those exposed to the waves and storms of the Atlantic. The species I refer to—the laminaria and fuci—are found growing on all rocky shores. And it may also be remarked that, except as manure, the great bulk of this material has been long practically unutilized. It is true that, when burnt into the rough slag known as kelp, this material was formerly the means of securing large revenues to the proprietors of the Western Islands. For several well-known reasons, that manufacture has long ceased to be profitable, and it never could have been considered as utilizing the seaweed, except in the sense that burning down a forest could be called utilizing it, when it ought to be cut into timber and really utilized in building houses or making furniture.

In 1862, the writer introduced a method of carbonizing the seaweed in retorts, and thus converting the material into charcoal instead of kelp, and preventing the great loss of iodine arising from open-air burning. This was simply another step of improvement, and, comparing it again with the forest, was merely equal to making the timber into charcoal instead of burning it into ash. It is not, in a proper and fuller sense, utilizing the seaweed. The results of further attempts in this direction form the subject of this paper. When we remark that the present wide-spread destitution and want of employment amongst the poor cottars is most severe in just those districts in Ireland and the Highlands where this material is most abundant, the importance of this inquiry will be at once seen. Indeed, if a remunerative price can be paid for a waste material that every child in a large family can easily assist in collecting at their own doors, it would go far to settle many existing difficulties, of which the worst is always hunger. And this brings me to mention the value of the algæ as a food material. In my paper, read before the Society of Arts, in 1862, on "The Economic Applications of Seaweed," the various kinds so used were described, and I have called attention more recently, in a paper read before the Chemical Society, to the fact that the analysis of the charcoal obtained from the various algæ approximates more nearly to that of a product of the animal than of the vegetable kingdom. I believe the algæ, generally, to be quite as valuable food products as the fungi, with the advantage that we are unaware of any poisonous species. Both are, however, equally neglected in this country. As the edible fungi are much consumed by other European nations, so the edible algæ are largely enjoyed and realize a high price in China and Japan. A sample of one of the Japanese varieties before us yielded on analysis a composition closely similar to our laminaria. It has, however, evidently been cut up, and presents the appearance of long shreds, and is coloured green by the action of an alkali. The poor people in Donegal are now eating the *Fucus vesiculosus* with Indian meal, and it is a common thing to see the Highland cattle browsing on this plant at low tide, The *Alaria esculenta*, or murlins, of which a fine specimen is on the table, may be called our edible species, but the *Rhodomenia palmata*, or dulse, is perhaps better known in Glasgow, being regularly sold on the streets.

The most important species consumed in this country is the *Chondrus crispus*, or Irish moss. This plant contains

* Read before the Chemical Section of the Glasgow Philosophical Society, April 2, 1883. Communicated by the Author.

79 per cent. of caragheenin, a substance of great gelatizing power, and largely used in jellies and puddings. This seaweed would, no doubt, secure a considerable market as a size for fabrics, but it cannot be obtained in any great quantity. It is only uncovered at low spring tides, and any very large demand would soon exhaust the supplies. A recent application of Irish moss is being worked by a limited company, under the name of "velo-plastic," which is said to be made of refuse leather, dried and finely ground and mixed with caragheenin. I am indebted to Mr. John A. Walker, of Dublin, for specimens of green and yellow morocco, poplin, and satin damask, and watered silk, all of which appear to be most successful imitations. The new substance to be described in this paper would probably answer equally well for this application.

Another still more powerful gelatizing substance is gelose. This was first imported into France from China in 1856. It has ten times the gelatizing power of isinglass, and will set into a jelly five hundred times its weight of water. It is not nitrogenous, and contains—carbon, 42·8; hydrogen, 5·8; oxygen, 51·4. It has not superseded isinglass for jellies, as the fusing point of the jelly is too high to melt in the mouth. I found some years ago, in experiments on every variety of seaweed that could be procured, that this gelatizing principle was confined to two British species—the *Chondrus crispus* and the *Gelideum corneum*. An Australian alga, the *Euchemia spinosa*, or agar agar, is also a jelly-yielding species. Several articles have recently been introduced under various names, such as thao, fucyne, etc., all of which appear to be modifications of, or products from, these plants.

The application of seaweed as manure is very general where it can be obtained. In fact the practical value placed on it is far above its actual chemical valuation. It usually contains 80 per cent. of water, so that 4 tons of water are carted to the land for every ton of dry seaweed, and even when dried there is not a large saving in carriage, as it is then very bulky. It is, however, carried long distances in some places, and there is no doubt that it is very valuable on soils that are all sand; but it is more of a mechanical value, as its use is not to *manure* but to *make* the soil—a rather expensive manufacture. Kelp waste, a ton of which, dry, represents 40 tons of wet seaweed, and contains all the phosphates of the weed in a convenient form—is absolutely unsaleable to farmers in this country at any price.

The only other important proposed application of seaweed has been to the manufacture of paper, and about twenty years ago several patents were taken out with this object, and some specimens were exhibited at the Society of Arts on the occasion before referred to. They were all made, however, from the *Zostera marina*, or grass wrack—a marine plant with flowers growing in the sea, but not one of the algæ—and this plant makes a very good paper. It created a good deal of attention at that time, having been proposed as a substitute for cotton during the cotton famine. It is not, however, available in large quantity, and contains very little fibre. The algæ generally contain no fibre, but, as far as my experiments have gone, nearly every species yields a very pure cellulose, which makes a tough, rather transparent paper. The tissue of the plant consists of simple cells of various shapes laid end to end, and in the fuci containing a dark pigment. This cellulose fabric, which forms the paper material, amounts, when quite dry, to 10 per cent. of the air-dry plant. In working on the fuci and the laminariæ my attempts to make a paper pulp were much impeded by a peculiar substance common to both these species, which was found at first difficult to remove, and the presence of which rendered the paper brittle. In fact this appeared to be always the case unless the cellulose was obtained quite pure. This substance is present in large quantity, and forms the bulk of the plant after the salts are removed.

Any one observing the long flat fronds of the laminaria lying on the sea shore must have noticed two things. 1st, that these are easily bleached by exposure to light; 2nd, that, after exposure to rain, the fronds contain in their interior sacs of fluid. These are derived from the endosmosis of the water through the outside membranes, dissolving a peculiar glutinous principle. Upon opening one of these sacs, a neutral glairy, almost colourless, liquid escapes. Sometimes it may be seen partially evaporated on the surface of the frond as a jelly-like substance, which may be drawn out by the fingers in long, tenacious strings. This fluid contains a unique substance of remarkable properties, and to which, from its source, I have given the name of algin. The vesicles are only seen in the long fronds of the various laminaria, especially *L. stenophylla*, known in the Highlands as bar-darrig, or red-top. The large stems or tangle, and the fuci, although containing it in considerable quantity, do not exhibit this appearance.

If the liquid be evaporated to dryness, the scales so produced resemble albumen, and are not all soluble in water, but very soluble on the addition of a little alkali. Several other instances of the solubility of substances when endosmosed or dialysed are well known. The fluid thus naturally obtained is miscible with water, but coagulated by alcohol and by mineral acids. It cannot be obtained in sufficient quantity for exhaustive analysis, but it contains calcium, magnesium and sodium, in small quantity, in combination with algin. If the laminaria fronds are cut up and macerated in dilute hydrochloric acid, the liquid in the vesicles assumes the form of a colourless, insoluble jelly. If the laminaria fronds are immersed in water containing a little alkali—by preference sodium carbonate—the whole plant becomes disintegrated, and presents a gelatinous mass, consisting of a thick, glutinous, gummy liquid, containing the cellular fabric of the plant completely broken up. This occurs in twenty-four hours in the cold. The mass, although it only contains 2 per cent. of the algin, is so glutinous that it cannot be poured out of the bottle. It is very difficult to deal with, on account of its extraordinary thickness. In fact, as it is, no method of filtration is possible (all known methods, with and without pressure, have been tried). The cells to be removed are so minute that, if pressure be applied, the whole mass passes through any filter or not at all. By cautiously heating the mass, it can, however, be filtered. The medium employed is a coarse linen sacking in the form of a Taylor's filter. The cellulose is left behind as a gelatinous mass, amounting, when dry, to about 10 per cent. of the air-dried plant.

The algin solution is then evaporated in a somewhat similar manner to gelatin, and, when dry, presents an appearance which is not unlike gum-tragacanth; but it may also be obtained in thin transparent flexible sheets. The solution is slightly alkaline; but care must be taken that no great excess of sodium carbonate is present, or the solution decomposes, and in a week, if dilute, becomes quite thin, and contains no algin. This action of the alkali I cannot yet clearly explain. The solution can be neutralized by the careful addition of hydrochloric acid without gelatinizing; but an excess at once precipitates it. A solution of only 2 per cent. becomes semi-solid, treated in this way. The following reactions are obtained with various reagents. For some of these the solution must be carefully neutralized with acetic acid, which does not gelatinize it.

Dilute hydrochloric, nitric, sulphuric, sulphurous, phosphoric and mineral acids generally, coagulate it. Boracic acid has no effect.

Lime water, baryta water, and salts of calcium, barium and strontium, give white precipitates.

Salts of magnesium do not affect it. Acetic, formic, citric, tartaric and benzoic acids do not affect it.

It is precipitated by alcohol.

Perchloride of iron gives a dark brown coagulum.

Salts of copper, zinc, aluminium, tin, antimony, cobalt and nickel, all precipitate it.

Protonitrate of mercury forms a white precipitate, but bichloride of mercury and silver nitrate have no effect.

Acetate and subacetate of lead both give white precipitates.

Potassium silicate and bichromate, sodium biborate* and potassium ferrocyanide, permanganate, sodium tungstate, stannate and succinate do not affect it. No precipitate is produced by tannin.

Concentrated sulphuric acid dissolves it; concentrated nitric acid converts it into oxidation products, amongst which are oxalic acid.

It is distinguished from albumen by not coagulating on heating, and by not precipitating silver nitrate—from gelose by not gelatinizing on cooling, and by containing nitrogen, which gelose does not; and being soluble in cold, weak, alkaline solutions, which gelose is not; and being insoluble in boiling water, in which gelose is soluble. The laminaria has been boiled in water for a month without effecting any solution, and for a week under 40 lbs. pressure with a similar result.

It is distinguished from gelatine by not giving any reaction with tannin—from starch by giving no reaction with iodine; from dextrine, gum-arabic, gum, tragacanth and pectin, by its insolubility in dilute alcohol and in dilute mineral acids.

I notice as particularly remarkable that it should precipitate all the salts of the alkaline earths except those of magnesium, and most of the metals except silver and mercury, and with regard to the latter that it should precipitate the protonitrate but not the bichloride; and that it gives no precipitate with potassium silicate.

The gelatinous precipitate produced by a mineral acid represents the algin in its pure insoluble form. It dries up to a hard, horny substance. A specimen can scarcely be distinguished from horn. I have not yet succeeded in getting it pure and definite enough to be certain of its composition; but I am indebted to Professor Ferguson for a combustion of the soda compound. This had been carefully dialysed to avoid the presence of excess of alkali, and gave the following numbers:—

Carbon	35·65
Hydrogen	4·40
Nitrogen	3·03
Oxygen	37·23
Ash	19·69
	100·00

This gives the following composition for the algin. I have appended also that of gelatin, isinglass, gelose, and chitin. In nitrogen it is intermediate between gelose and gelatin, but it approaches nearer to chitin than any other substance. Fremy, however, denies the presence of nitrogen in this substance. It differs entirely from algin in being insoluble in alkalies.

	Algin.	Gelatin.	Isinglass.	Gelose.	Chitin.
Carbon	44·39	50·0	50·1	42·77	46·64
Hydrogen	5·47	6·5	6·6	5·77	6·60
Nitrogen	3·77	17·5	18·3	—	6·56
Oxygen	46·37	26·0	25·0	51·46	40·20
	100·00	100·0	100·0	100·00	100·00

(Sulphur, ·12.)

The percentage of ash in the soda compound does not materially vary. The two following were made—one with sodium hydrate, and the other with sodium carbonate, and yielded almost the same amount of ash:—

Sodium hydrate—percentage of ash	31·51
Sodium carbonate, do.	31·37
Mean	31·44

* It can be extracted by a solution of borax.

Although I believe the composition to be stated correctly, I cannot construct a formula from these figures; and all attempts to procure definite compounds for analysis have as yet been unsuccessful. The following compounds have been prepared and investigated with this view:—Compounds with calcium, aluminium, barium and lead—but the results have not been uniform enough to show that we have been examining definite compounds.

The sodium carbonate appears to be unaltered in the compound, but completely masked. The carbonic acid comes off only when acidified with an excess of hydrochloric acid, and heated.

The acid has also some decomposing effect, and produces a small quantity of a substance which precipitates Fehling's solution, but does not appear to be glucose.

A solution, 1000 grs. measure, containing 13·2 grs. of algin, was precipitated by standard sulphuric acid, and redissolved by standard sodium hydrate, six times in succession.

1st precipitation took of sulphuric acid (SO_3), grains			5·430
2nd	,,	,,	4·070
3rd	,,	,,	3·086
4th	,,	,,	1·975
5th	,,	,,	0·617
6th	,,	,,	0·617
1st resolution took of soda (Na_2O), grains			3·778
2nd	,,	,,	2·871
3rd	,,	,,	2·052
4th	,,	,,	1·530
5th	,,	,,	0·670
6th	,,	,,	0·478

As the precipitate is not soluble in sodium sulphate, there appears to be some decomposition continually going on, and this has not yet been sufficiently investigated to enable me to ascertain the exact action of the hydrochloric acid.

The process proposed to deal with the seaweed is first of all to wash out the salts by simple maceration in cold water. This is very easily done, the salts being almost entirely removed, even by two macerations. On account of the bulk of the material it is, however, advisable to wash a number of vats exhaustively in turns, in the usual manner of lixiviation common in alkali works. The water removes about a third of the weight of the seaweed, and when evaporated to dryness presents a treacly mass containing the salts and a considerable quantity of a saccharine matter which resembles mannite, but which precipitates Fehling's solution equal to 15 per cent. of glucose. It is, however, unfermentable, and I have not yet succeeded in getting it pure enough for analysis, on account of the great difficulty of separating it from the alkaline chlorides which are soluble in alcohol. By the use of sulphate of silver I have separated a small quantity, but still not sufficiently pure. If this can be separated commercially, and is a sugar having sweetness but unfermentable, it would be available for replacing glycerine in some of its applications. Until, however, more is known of its properties it must be sacrificed by carbonizing the salts, the charcoal, of which it yields about 50 per cent., being then treated in the usual manner for separating the iodine and salts. The salts vary from 35 to 55 per cent. of the whole; or 12 to 18 per cent. of the original air-dry weed in the laminaria. This is more than is obtained by burning the weed into ash, which does not, as a rule, yield more than 10 per cent. of salts on the air-dried weed.

It is interesting to notice the way in which these salts come out, and analyses have been made with this view. The results are shown in the following tables:—Calcium sulphate and magnesium chloride are both present in the aqueous solution of the laminaria and in the residue of the fuci—carbonates generally in the salts of the fuci and the residue of the laminaria. In the latter, which is always submerged, the relation of the magne-

sium to the calcium is singularly like that existing in sea water.

Within certain limits the composition of the salts differs considerably, the age of the plant and the time of gathering both affecting it.

(*To be continued.*)

THE PRESERVATION OF SYRUP OF IODIDE OF IRON.*

BY C. VAN WISSELINGH.

Some time ago J. de Groot published a paper in the *Pharmaceutisch Weekblad* (Sept. 17, 1882), in which he states that syrup of iodide of iron which has been kept in an open burette, and which was protected from contact with air by a layer of oil, was found to have lost 3 per cent. of its ferrous iodide. This statement induced the author of the present paper to examine the subject carefully, and his results are detailed below.

Three burettes of 100 c.c. capacity were nearly filled with freshly-prepared syrup of iodide of iron, and a layer of 5 c.c. of some fixed oil poured on top of each, the following oils being selected: almond oil, olive oil and castor oil. A small quantity of fixed oil would have served equally well to prevent contact with the air. I took a larger quantity to see what effect the oil itself would have on the syrup.

The percentage of ferrous iodide was determined by titration with a solution of mercuric chloride. As is well known, the addition of this reagent to a solution containing ferrous iodide in excess produces a red precipitate of mercuric iodide which is dissolved on stirring, as it forms a soluble double salt with the still undecomposed ferrous iodide. Whenever the precipitate no longer redissolves on stirring no more ferrous iodide remains undecomposed, and the reaction is completed. The solution of mercuric chloride is made of such a strength that 10 c.c. of it are required, in presence of 1 gram of ferrous iodide, to reach the point when a further addition will produce a permanent precipitate. In the actual titration I employed 5 grams of the syrup carefully weighed and afterward diluted with 5 c.c. of distilled water. In order to convince me that the above method yields correct results, the percentage of iodine was also determined by distillation with ferric chloride, by titration with hyposulphite of sodium and also with nitrate of silver, chromate of potassium being used as indicator in the last named case. The results of all these methods of assay were found to agree well among themselves, and with that above detailed.

Immediately after being prepared, the syrup in the different burettes contained, theoretically, 19 per cent. of ferrous iodide. The different assays gave figures varying from 19 to 19·2. Several times during each week, in the course of one month, the assay of the syrup in each burette was renewed, and no diminution of the percentage noticed. After four months the assay again yielded from 19 to 19·2 per cent. of ferrous iodide.

Now I determined to examine that portion of the syrup which was immediately below the layer of oil. Enough syrup was drawn from each burette to retain about 10 c.c. of which two separate assays were made. The mean results obtained were the following.

Syrup kept under almond oil . . .	19·17 per cent.
Syrup kept under olive oil . . .	19·17 per cent.
Syrup kept under castor oil . . .	19·13 per cent.

Finally the oils were examined. They all had acquired a more or less brown colour; the castor oil was very dark, less so the olive oil, and the almond oil had assumed only a brown tint. To estimate any iodine present in the oils, I used the following method. The oil was saponified with alcoholic solution of potash, by the aid of a few hours' heating on the water-bath, in a porcelain capsule. The soap was then carefully heated and carbonized in the capsule, the mass lixiviated with water, the solution acidulated with hydrochloric acid, and any iodide of potassium present determined by solution of mercuric chloride, three times more dilute than that mentioned above. A preliminary experiment convinced me of the reliability of this method. Although in all three solutions the presence of traces of iodine could be detected by chlorine water and chloroform as well as by nitrate of silver, yet the quantity was so minute that I could not estimate it quantitatively.

These results show that de Groot's statements cannot be correct. He states that he found a diminution of 2·941 per cent. of ferrous iodide in a syrup standing two months. I could not detect any diminution of the percentage even after four months, and only noticed the syrup becoming somewhat lighter of colour, while the oils took up only a minute trace of iodine.—After *Nieuw Tijdschrift voor de Pharmacie*, 1883, 77.

Note.—Many years ago, we have made experiments on the keeping of syrup of iodide of iron, and have found that it may be kept in bulk, in any quantity, if it be protected from contact with air by a layer of oil on the surface. A large stone jar with a glass faucet at the bottom will be found a useful receptacle. Or a glass siphon may be kept in the jar, reaching nearly to the bottom, the outer arm being provided with a short piece of rubber tubing and a pinchcock.—*Ed. N. R.*

* From *New Remedies*, May, 1883.

TESTING EXTRACT OF LICORICE.*

Professor C. L. Diehl, of Louisville, Ky., having had occasion to examine some commercial licorice paste as to purity, devised a modified method for the estimation of its constituents, and published the same in the February issue of the *Pharmazeutische Rundschau.*

I. Expose 1·0 gram of the mass to a gentle heat until it experiences no further loss in weight. Calculate this loss as moisture.

II. Digest 10·0 grams of the mass contained in a flask with 100·0 grams of distilled water until it is fully disintegrated; when cold cautiously pour on 200·0 grams of alcohol and vigorously shake the flask. By this procedure the precipitate produced will be prevented from adhering to the sides of the vessel. Allow it to stand for several hours, shaking occasionally, then pour on a double thick filter of sufficient size, and wash the remaining dregs with a mixture of two parts of alcohol and one part of water until the filtrate begins to pass colourless.

III. After the foregoing residue has become air-dry, exhaust the same with distilled water, so that the filtrate may pass colourless; reduce the latter to a small volume and then transfer to a small tared porcelain capsule, being careful to remove any residue from the larger evaporating dish by means of a little warm distilled water, adding the rinsing to the contents of the small capsules. Evaporate to dryness by means of a gentle heat, and calculate the residue as gummy matter.

IV. Carefully dry the dregs remaining on the filter under III., employ the outer filter as counterbalance and calculate as insoluble substance.

V. Carefully concentrate the alcoholic filtrate obtained under II. to the consistence of syrup and redissolve in distilled water. Then, to the clear solution, add dilute sulphuric acid gradually until a precipitate (glycyrrhizin) ceases to be produced. Wash the glycyrrhizin with cold water, allow to dry at the ordinary temperature, and dissolve in strong alcohol, whereby about fifteen per cent. of insoluble tastless residue will remain, which, however, is soluble in ammonia. Now filter the alcoholic solution of glycyrrhizin, wash the filter with alcohol, evaporate the combined filtrates to dryness, then redissolve the residue in a small quantity of ammonia, again evaporate to dryness in a tared capsule, and estimate as ammoniated glycyrrhizin.

* From *New Remedies*, May, 1883.

The Pharmaceutical Journal.

SATURDAY, JUNE 9, 1883.

Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE "CRITICAL POINT" OF GASES.

NOTWITHSTANDING the many able investigators who have studied the phenomena attending the liquefaction of gases under the influence of pressure there are several points which are still imperfectly understood, and especially has there been a divergence of opinion respecting the significance of one of the most curious of them, the peculiar appearance manifested at what has been designated by Dr. ANDREWS the "critical point." It is well known that this distinguished physicist's experiments led him to think that under certain conditions of temperature and pressure there is a point at which matter exists in a condition that cannot be described either as liquid or gaseous, but is intermediate between the two states, and from which, under a definite variation of the conditions, it is capable of passing almost imperceptibly into either. This view has not gone unchallenged, and only a short time since Dr. HANNAY, after making a large number of experiments wherein hydrogen was submitted to pressure over various liquids in which it is insoluble, deliberately expressed his opinion that the gaseous and liquid states of matter are not more continuous than the liquid and solid states.

The success which has recently attended the efforts of two Polish experimenters to effect the liquefaction of oxygen, nitrogen and carbonic oxide, under conditions in which the resulting liquid can be retained for observation, has redirected attention to the general subject, and M. JAMIN has seized the opportunity to lay before the French Academy of Sciences some conclusions at which he has arrived. M. JAMIN, who maintains that gases are liquefiable at any temperature if the pressure be sufficient, gives the following explanation of the "critical point." Taking one of the earlier experiments of CAGNIARD-LATOUR, where a thick glass tube, two-thirds full of water under the pressure of its own vapour, is sealed and heated to 300° or 400° C., he points out that according to known laws the quantity of vapour lying above the liquid augments very rapidly, and that its density increases in the same ratio as its weight, while, on the other hand, the remaining portion of the liquid undergoes a growing expansion which eventually exceeds that of the gas; it follows therefore, as a consequence of these inverse variations, that a limit of temperature is reached where equal volumes of the liquid and the vapour have the same weight. At this point they cease to remain separate; the meniscus disappears; the liquid and vapour become mixed, presenting undulating striæ such as are characteristic of a mixture of liquids of different densities, and finally the whole takes a homogeneous form which has been supposed to be gaseous. This is the "critical point," which M. JAMIN defines as the "temperature at which a liquid and its saturated vapour have the same density." Although no liquid is now perceptible it still remains diffused through the gas at its boiling point and maximum tension in virtue of its equal density; but as the temperature rises the tension continues to increase until the entire volatilization of the liquid, when, and not till then, there remains only a dry vapour or gas above its point of liquefaction. The inability to recognize the presence of the liquid in the gas is attributed to the fact that the conditions which ordinarily allow of a saturated vapour being distinguished from the liquid from which it is generated are not present, there being no difference in the density of the two, whilst no heat becomes latent, since there is no change of volume and consequently no expansion. So also the experiments of Dr. ANDREWS have shown that when a gas is submitted to gradually increasing pressure in a closed tube a definite limit is reached, the maximum tension, upon passing which the gas is condensed; this is the point of liquefaction, or boiling point at this pressure, and this pressure of liquefaction augments rapidly with the temperature without any known limit.

M. JAMIN argues that this theory of the equalization of the densities brings the phenomena into accord with all the laws as to the formation and condensation of vapours and explains the apparent anomalies in connection with the "critical point." For instance, in 1880, M. CAILLETET had stated that in submitting to pressure, in his apparatus, a mixture consisting of one part of air and five parts of carbonic acid, it was observed the latter gas took the liquid form at a moderate pressure; but upon increasing the pressure to one hundred and fifty or two hundred atmospheres the liquid already formed entirely disappeared. This observation had remained unexplained; but M. JAMIN, applying his theory to it, inferred that a portion of the carbonic acid having become liquefied at a moderate pressure, it was not further affected by continued reduction of the volume of the containing vessel, having already attained its maximum density, whilst the pressure upon the gaseous air increased, and with that its density, until this equalled the density of the liquefied carbonic acid, and intermixture followed. If this inference were correct, it would follow that upon substituting a gas of less density, such as hydrogen, for the air in the mixture, the equaliza-

tion of the densities, and the consequent disappearance of the liquified carbonic acid, would be retarded. The question was submitted to the crucial test of experiment by M. Cailletet, who obtained results quite in accord with M. Jamin's theory. M. Cailletet made two mixtures, one containing five volumes of carbonic acid and one of air, the other five volumes of carbonic acid and one of hydrogen, and submitted them to pressure. In both cases he obtained the liquefaction of the carbonic acid under moderate pressure, and the total disappearance of the liquid under more powerful compression. First the meniscus disappeared at the moment when the densities of the liquid and the air became equal, and afterwards the liquid disappeared, and, in conformity with the theory, at a pressure very different and much more considerable with the mixture containing hydrogen than with that containing air. Thus whilst at a temperature of 15° C., a pressure of one hundred and thirty-five atmospheres was coincident with the disappearance of the carbonic acid first liquefied from a mixture containing air, a pressure of two hundred and forty-five atmospheres was reached before a similar phenomenon occurred with a mixture of carbonic acid and hydrogen. At 20° C. the pressures at which the liquid disappeared were with carbonic acid and air, one hundred and eight atmospheres, and with carbonic acid and hydrogen, one hundred and ninety-nine atmospheres; whilst at 25° they were seventy-nine atmospheres and one hundred and fifty-three atmospheres respectively. When the mixture was less rich in carbonic acid, M. Cailletet found that the evident liquefaction of this gas was retarded and sometimes unattainable. The explanation offered is that when a mixture of air and gas is reduced to a smaller volume by pressure they undergo equal reduction, but not the same increase of tension; that of air being directly as the decrease of volume, whilst that of carbonic acid augments less rapidly, since Mariotte's law no longer applies. Liquefaction of the carbonic acid does not therefore take place relatively at so early a period, and when eventually it does attain its maximum tension, its density may be the same, or sometimes below, that of the air above it. It is consequently in a state in which it will readily become diffused through the air and escape recognition as a liquid; this might lead to the supposition that under such conditions carbonic acid gas is incapable of liquefaction, whilst it has only lost the property of collecting at the bottom of the containing vessel in virtue of a relatively greater density. M. Jamin hoped that by increasing the pressure the carbonic acid would continue to liquefy, and that as in so doing its density would vary only slightly, whilst that of the air would augment indefinitely and eventually become superior, a point would be reached at which separation would take place, and the curious result would be obtained that the liquefied carbonic acid would float above the denser, but still unliquefied air. At present, however, all attempts made M. Cailletet in this direction have been unsuccessful.

We are requested by the Secretary, Mr. Bremridge, to say that he will be glad to receive votes for the election to the London Orphan Asylum, on the 25th inst., in order to secure the admission of an orphan in whom the Society is interested.

* * *

Once more the second reading of the Medical Acts Amendment Bill has been postponed, and it is now set down for Monday next. On Thursday, in reply to a question put by Lord Randolph Churchill, as to the intention of the Government with respect to this Bill, Mr. Gladstone declined to say anything which would lead to the supposition that it would interfere with the Tenants' Compensation Bill. He remarked, however, that the Bill had been the product of very great labour and he believed it had received the very general consent of the medical profession; under these circumstances, he thought it would be favourably received in the House of Commons and he looked forward to seeing it passed during the present session.

* * *

According to the "Notes and Proceedings," petitions for the alteration of the Medical Bill were on Tuesday presented from the "Chemists', etc., Association and Glasgow." If, as appears possible, petitions from two associations of chemists and druggists in respect to the proper representation of pharmacists upon the Pharmacopœia Committee are indicated under this curt description, it is regrettable that their presentation was not delayed until a period nearer to the time when this particular subject is likely to come under the notice of the House, during the passage of the Bill through Committee.

* * *

In reply to a deputation of "Medical Herbalists," who were afraid that the Medical Acts Amendment Bill, if passed, would be prejudicial to their interests, Mr. Mundella said, on Tuesday last, that the Bill would not affect them at all, as long as they abstained from using improper titles.

* * *

By the courtesy of the Secretary of State for Foreign Affairs we are informed that a dispatch has been received from Her Majesty's Ambassador at Rome, reporting that in answer to representations addressed by him to the Head of the Italian Commercial Department respecting the restrictions on the sale of patent medicines in Italy, that officer has explained that the object of the Medical Board was to prevent the introduction of patent medicines containing drugs injurious to health, and that if it could be shown that the medicines for which admission was applied for were sanctioned in any properly authorized pharmacopœia, there would probably be no difficulty as to their admission.

* * *

It will be seen from a letter published on another page that Mr. R. Barrington Cooke, to whose remarks on the necessity for placing the sale of butter of antimony under more stringent regulations we referred last week, has been in communication with Mr. Mundella on the subject, and has "every reason to believe" that his suggestion "will be carefully considered and probably adopted." Whilst gratified to observe this practical endorsement of the recent action of the Council, we are unable to think that the point which was refused to the body charged by the Legislature with the initiative in making

additions to the poison schedule will be conceded to a private individual.

* * *

Sanitary reformers may well be satisfied with the increased attention now paid by the general public to their teachings. A few years since they were looked upon as visionary, and rather troublesome, enthusiasts, but on Saturday last, the occasion of the opening of an exhibition of hygienic dress and sanitary domestic appliances and decoration at Knightsbridge, under the auspices of the National Health Society, attracted a distinguished company of civic dignitaries, leaders of the medical profession, and others. Mr. Ernest Hart described the nature and object of the exhibition, and in doing so incidentally presented some statistics that were sufficiently remarkable to arrest the attention of those of his audience whose municipal position may enable them to exercise a salutary influence in favour of improved hygiene. Briefly, Mr. Hart estimates that the saving of life effected in the metropolis during the last ten years by improved sanitation at 480,000 lives, or 48,000 lives annually, which means a yearly money saving with respect to sickness and funerals alone of at least a quarter of a million sterling. Some further figures quoted respecting the buildings of the Artizans' Improved Dwellings were so remarkable as almost to suggest some other explanation of them than the one implied; for, according to Mr. Hart, in these buildings the death rate has been reduced, in the case of infants, from 47 to 24 per 1000, and in the case of adults, from 17 to 10 per 100. The Lord Mayor formally declared the exhibition open, and whilst it was in accordance with a very prevalent idea that his thoughts should flow towards the subject of good dinners, he was undoubtedly quite right in pointing out that much remains to be done in the direction of teaching people how to cook their food without spoiling it and depriving it of its nutritious properties.

* * *

The first subject of research in connection with the quadrennial Discovery Prize of £1000 recently instituted by the Grocers' Company (see before, p. 807) has now been announced by the Committee, and the problem set lies quite within the field of experiment open to many of our readers. It is "to discover a method by which the vaccine contagium may be cultivated apart from the animal body, in some medium or media not otherwise zymotic: the method to be such that the contagium may by means of it be multiplied to an indefinite extent in successive generations, and that the product after any number of generations shall (so far as can within the time be tested) prove itself of identical potency with standard vaccine lymphs." Competitors for the prize, who may belong to any nation, must submit their treatises on or before December 31, 1886, and the award will be made not later than May, 1887. The Scientific Committee, under whose advice the Grocers' Company is acting, consists of Dr. Simon, Professor Tyndall, Dr. J. Burdon Sanderson and Dr. George Buchanan. The Grocers' Company has issued a circular stating the conditions of candidature and award, copies of which may be obtained from the Clerk to the Company.

* * *

The report of a case of prosecution by the Inland Revenue authorities, which was published in this Journal last week, shows that notwithstanding all that has been said there still exists misapprehension as to the sale of quinine wine. It cannot be too clearly understood that the permission to sell quinine without a licence or stamp only extends to it when prepared of the strength and according to the directions of the Pharmacopœia, and supplied as such. If the "wine" sold does not represent the Pharmacopœia preparation, the seller must hold a wine licence, whilst, in any case, if it be recommended for the cure of disease, it must be stamped as a "patent medicine."

* * *

Another subject upon which we have reason to believe some misconception exists is the extent to which rectified and methylated spirit may be supplied by chemists and druggists. It is not likely that the excise authorities will attempt to interfere with the supply within reasonable limits of ordinary alcohol as medicine on the prescription of a medical man. But this tolerance must not be assumed to extend to the supply without a licence of methylated spirit, the use of which in the preparation of any medicine capable of being used internally is expressly forbidden under the 130th section of the "Spirits Act, 1880."

* * *

The use of liquefied carbonic acid in the preparation of carbonated beverages is recommended by Mr. Apotheker Volk, of Ratzeburg, who states that experiments have proved it to be the purest, most suitable and best method of impregnating mineral waters. It is also claimed that by using the carbonic acid in this form the more expensive part of the apparatus now used in the manufacture could be dispensed with. It is evident, however, that even should a sufficiently cheap supply of pure liquefied carbonic acid be forthcoming, special precautions will have to be adopted as to the containing vessels and the manner in which they are stored, as the gas requires at 0° C. for its liquefaction a pressure of 36 atmospheres, which increases rapidly with a rise of temperature. It would be worth while to carry the experiment a little further and try the solidified acid, the relatively slow evaporation of which, even when exposed to the air, might facilitate manipulation.

* * *

An extraordinary dispensing mistake is recorded by the *St. Louis Druggist* as having occurred in the City Hospital, St. Louis. Two patients were ordered to be supplied with "30 drachms of sulphate of magnesia in cinnamon water," and a third with 25 drachms. In some unexplained way the hospital dispenser substituted chloral hydrate for sulphate of magnesia, with the result that within an hour of taking the medicine two of the patients were dead and the other in a dangerous condition. A coroner's jury returned a verdict of "death through culpable negligence," and the dispenser has been lodged in prison to await his trial.

* * *

At the Second Annual Meeting of the Virginia State Pharmaceutical Association, held last month in the city of Norfolk, Professor Attfield was unanimously elected an Honorary Member of the Association.

* * *

The name of Sir Frederick Augustus Abel, K.C.B., F.R.S., occurs in the list of names of gentlemen upon whom it is proposed that the University of Oxford shall confer the degree of D.C.L., at a Convocation to be held on Wednesday next.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL.

Wednesday, June 6, 1883.

Present—Messrs. Andrews, Atkins, Borland, Bottle, Butt, Carteighe, Churchill, Greenish, Hampson, Hills, Radley, Richardson, Robbins, Savage, Schacht, Squire, Symes, Williams, Woolley and Young.

Mr. Carteighe having taken the chair, the minutes of the Council meetings of May 2 and 23 were read and confirmed.

Election of President.

A ballot having been taken in the usual way—

MR. MICHAEL CARTEIGHE

was re-elected President.

The President thanked the Council for this renewed mark of its confidence, and said he hoped he should be able to continue to serve the Council and the Society with satisfaction to all concerned.

Election of Vice-President.

On a ballot being taken—

MR. SAMUEL RALPH ATKINS

was re-elected Vice-President.

The Vice-President also briefly thanked his colleagues for the honour they had done him.

Election of Treasurer.

A ballot having been taken—

MR. JOHN ROBBINS

was re-elected Treasurer.

Mr. Robbins expressed his thanks, and said it was always gratifying to anyone who filled such a position to find that he had an ample reserve to draw upon and that he left office at the end of the year with the finances in a better state than when he commenced his duties.

Standing Orders.

The Standing Orders were then adopted for the ensuing year.

Secretary and Registrar.

Mr. Elias Bremridge was unanimously re-appointed Secretary and Registrar.

Assistant Secretary and Deputy Registrar.

Mr. Richard Bremridge was also unanimously re-appointed Assistant Secretary and Deputy Registrar.

Elections.

PHARMACEUTICAL CHEMIST.

Joshua David Pidgeon, of New Cross, having passed the Major examination and tendered his subscription for the current year, was elected a "Member" of the Society.

CHEMISTS AND DRUGGISTS.

The following registered chemists and druggists, who were in business on their own account before August 1, 1868, having tendered their subscriptions for the current year, were elected "Members" of the Society:—

Bowman, William.....Liverpool.
March, William.....Queenstown, Cape Colony.
Williams, Edward .....Mold.

ASSOCIATES IN BUSINESS.

The following, having passed the Minor examination, being in business on their own account, and having tendered their subscriptions for the current year, were elected "Associates in Business" of the Society:—

Alpe, Robert Bird .....Wymondham.
Beck, Albert Neve .....Hastings.
Ellis, George Waddington .....Birkdale
Furness, Thomas .....Chesterfield.
Hewitt, John Richard.....London.
Mansergh, William .....Manchester.
Swift, Philip Dickerson .....Tottenham.
Thresh, Arthur.....Buxton.
Waddington, John William ...Hungerford.

ASSOCIATES.

The following, having passed the Minor examination, and tendered (or paid as Apprentices or Students) their subscriptions for the current year, were elected "Associates" of the Society:—

Brunt, George Henry .....Norwich.
Campion, Martin Hand .....Louth.
Fitzjohn, Francis .....Whittlesea.
Fraser, John .....Edinburgh.
Hickson, Robert William .....Hull.
Low, David .....Hexham.
Norman, William Francis .....Towcester.
Pearson, William Jackson .....Little Gonerby.
Richards, Arthur.....Swansea.
Simpson, Charles .....Aberdeen.

APPRENTICES OR STUDENTS.

The following, having passed the Preliminary examination and tendered their subscriptions for the current year, were elected "Apprentices or Students" of the Society:—

Cox, Frederick Hudson .....Southampton.
Day, John Thomas .....London.
Denham, Albert Shaw .....Preston.
Ellerington, John Parker .....Hexham.
Hallawell, Joseph L. .....Ayr.
Hollis, Henry .....Birmingham.
Jackson, Harold .....Manchester.
Lees, James .....Leighton Buzzard.
McLanachan, John .....Sheffield.
Metcalf, Rowland Alfred .....Uxbridge.
Muskett, Frederic James .....Newport Pagnel.
Ogdon, William .....Derby.
Peacock, George .....Heslerton.
Ryall, Frederick John.....Devonport.
Scholey, John .....Burnham.
Scott, Sack Noy .....St. Austell.
Smith, Edwin Wells .....Sheffield.
Stark, George Miller .....Gatehouse.
Thacker, Harry Ransby .....Nottingham,

Several persons were restored to their former status in the Society upon payment of the current year's subscription and a fine.

Restorations to the Register.

The names of the following persons, who have severally made the required declarations and paid a fine of one guinea, were restored to the Register of Chemists and Druggists:—

William George Clapperton, 610, Myrtle Avenue, Brooklyn, U.S.A.
John Henry Hateley, 4, Shawclough, Rochdale.

Additions to the Register.

The Registrar reported that—

David Fairbrother, 2, Flitcroft Street, Manchester;
Joseph Woods, Tunstall, Staffs;
Sarah Craig, Howgate, Kilwinning, Ayrshire;

having made statutory declarations that they were in business before the passing of the Pharmacy Act, 1868, and these declarations having been supported by duly qualified persons, their names had been placed on the Register.

Appointment of Committees.

The Council went into committee to receive suggestions and discuss details of the committee arrangements. On resuming the following were appointed:—

General Purposes.—The whole of the Council To meet at six o'clock on the evening before the Council meeting and at such other times as may be required.

Finance.—Messrs. Andrews, Gostling, Hills, Savage, Schacht, Squire and Symes. To meet at half-past four o'clock on the afternoon preceding the Council meeting.

Library, Museum, Laboratory and House. — Messrs. Andrews, Bottle, Butt, Gostling, Greenish, Hampson, Hills, Richardson, Robbins, Schacht, Squire and Williams. To meet at eleven o'clock on the second Wednesday in every month except August and September.

Benevolent Fund. — Messrs. Bottle, Butt, Borland, Churchill, Greenish, Radley, Richardson, Robbins, Williams, Woolley and Young. To meet at half-past three o'clock on the day preceding the Council meeting.

Law and Parliamentary. — Messrs. Bottle, Butt, Greenish, Hampson, Hills, Robbins, Squire, Symes, Williams, Woolley and Young. To meet as occasion may require.

The President and Vice-President are *ex officio* on all the above committees.

Evening Meetings.—The President, Vice-President, the three Professors, the Editor and the Curator of the Museum.

Freehold Investment Committee.—The President, Vice-President, Treasurer, and Mr. Butt.

Spurious Drugs Committee.

Mr. WILLIAMS asked if it were desirable to appoint a Spurious Drugs Committee.

The President and other members having expressed the opinion that it was necessary to have such a committee ready to act at any time required, the following gentlemen were appointed:—The President, Vice-President, Messrs. Greenish, Hampson, Richardson, Symes, Williams, Woolley and Young, with power to add to their number.

APPOINTMENT OF EDITOR AND SUB-EDITOR OF THE JOURNAL.

Dr. PAUL was re-appointed Editor of the Society's Journal for the ensuing year, and Mr. PASSMORE the Sub-Editor.

APPOINTMENT OF CURATOR.

Mr. HOLMES was re-appointed Curator for the ensuing year.

LOCAL SECRETARIES.

The PRESIDENT said he was informed by the Secretary that the number of towns eligible last year to have a Local Secretary was three hundred and two. This year the number of towns eligible was three hundred and ten, thirteen having been added and five removed from the list. From two hundred and fifteen of them nominations had been received, whilst ninety-five had made no nominations.

The appointment of Local Secretaries was referred to the Library, Museum, Laboratory and House Committee for consideration and report.

THE NORTH BRITISH BRANCH.

Mr. J. B. STEPHENSON was unanimously re-elected Honorary Treasurer to the North British Branch.

Mr. P. MACEWAN was re-appointed Secretary to the Branch.

REPORTS OF COMMITTEES.

LIBRARY, MUSEUM, LABORATORY, AND HOUSE.

The report of the Committee was read.

Librarian's Report.

This report of the Librarian had been received, and included the following particulars:—

Attendance.		Total.	Highest.	Lowest.	Average.
April	Day	701	35	16	28
	Evening	203	16	4	9

Circulation of books.	No. of Entries. Town.	Country.	Total.
April	181	116	297

Carriage paid, £1 10*s.* 10½*d.*

The undermentioned donations to the Library had been received, and the Committee recommended that the usual letter of thanks be sent to the respective donors:—

Canning (W.), The Chemists' and Dispensers' Vade Mecum, 1882. From the COMPILER.
Collin (Eug.), Recherches sur l'Origine et la Nature de la Rhubarbe de la Chine, 1882.
— Revue des Médicaments Chimiques, 1882.
— Revue des Médicaments d'Origine Végétale, 1882.
— Des avantages que peut offrir l'Emploi du Microscope pour l'Analyse des Denrées Alimentaires, 1883. From the AUTHOR.
Hérail (J.), Les Fumariacées, thèse, 1883. From the AUTHOR, through Prof. SOUBEIRAN.
City of Boston, Report of Inspector of Vinegar, 1883. From Dr. B. F. DAVENPORT.
Nicklès (Adr.), Notes Linguistiques à propos du Recueil des Travaux du Bureau Ethnologique publié par la Smithsonian Institution à Washington. From the AUTHOR.
Méhu (C.), Remarques sur les Variations de la Composition du Sperme. From the AUTHOR.
Brozowsky (W.), Waarenkunde, 1869.
Nieuw Tijdschrift voor de pharmacie in Nederland, Jan.–April, 1883.
Parrish (E.), Treatise on pharmacy, 4th ed., 1874. From Dr. JUL. MOREL.
Mueller (F. v.), Systematic Census of Australian Plants, part 1, Vasculares, 1882. From the VICTORIAN GOVERNMENT, through the AUTHOR.

The Committee approved of the purchase of two more copies of British Pharmacopœia, and also recommended that two copies of the undermentioned work be purchased:—

United States Dispensatory, 15th ed., 1883.

Curator's Report.

The Curator had reported that the attendance in the Museum during the month of April had been:—

	Total.	Highest.	Lowest.	Average.
Morning	546	36	5	20
Evening	115	10	2	5

The following donations to the Museum had been received, and the Committee recommended that the usual letter of thanks be sent to the respective donors:—

Specimen of Green Ginger. From Dr. SYMES, Liverpool.
Specimens of Cinchona barks cultivated in Ceylon, with herbarium specimens of *C. officinalis*, *C. succirubra*, *C. Ledgeriana* and a *hybrid Cinchona*. Forwarded through HER MAJESTY'S SECRETARY OF STATE FOR THE COLONIES.

A series of duplicate specimens of medicinal plants had been forwarded to the York Chemists' Assistants' Association; labels had also been supplied to the Leeds School of Medicine, and to Mr. Martindale.

The Professors had attended and reported satisfactorily on their respective classes.

The Committee had considered the working of the bye-law relating to payments in commutation of arrears of subscriptions, and it was deemed desirable that the amount should not as a rule exceed two guineas; but if in any case the Secretary considered a larger amount should be paid, the particulars of the case should be submitted to the Finance Committee.

The President, in pursuance of a resolution of the Council, had sent a letter to Mr. Mundella on the subject of the Medical Acts Amendment Bill, with special reference to the Pharmacopœia, in which he had asked if Mr. Mundella would receive a deputation on the subject. Mr. Mundella had replied, saying, that as it was not proposed to alter the Bill he did not think it

worth while for a deputation to attend, but he should be happy to see the President after the Whitsuntide holidays. The Committee had thereupon desired the President and Mr. Hampson to arrange for an interview, and if they thought it expedient to issue to Local Secretaries and others circulars and forms of petition to the House of Commons.

The Committee had also considered the form of amendment to the Medical Bill which it was desirable should be proposed in the House of Commons.

The Council went into committee and discussed the action to be taken with regard to the Medical Acts Amendment Bill.

On resuming, it was moved by Mr. SCHACHT and seconded by Mr. CHURCHILL, that the paragraph of the report referring to the fine to be imposed on members seeking re-admission be referred back to the Committee for reconsideration.

The motion was lost by a large majority, and the report and recommendations of the Committee were received and adopted.

FINANCE.

Messrs. Butt, Carteighe, Hills and Schacht had acted as a Finance Committee, and examined the receipts and accounts sent in during the month, which were recommended for payment.

The report and recommendations were adopted.

Freehold Investments.

The Council went into committee to consider a proposal for purchasing freehold ground rents.

On resuming, the report was received and adopted.

BENEVOLENT FUND.

The President, Treasurer, and Mr. Butt had considered an application for relief from the widow of a registered chemist and druggist (who had been in business twenty-three years), and recommended that a grant of £10 be made.

The recommendation was adopted.

PHARMACOPŒIA REVISION.

The Council then went into committee to consider a communication from Mr. Miller, the Registrar of the Medical Council, enclosing a printed memorandum from the Chairman of the Pharmacopœia Committee of the Medical Council, which was laid before the Council at its meeting on the 23rd inst. (see before, p. 963). After a long discussion it was resolved that the receipt of the communication should be acknowledged, and that Mr. Miller be informed that it had been submitted to the Council.

THE SESSIONAL ADDRESS.

On the suggestion of the President it was remitted to the Library, Museum, Laboratory and House Committee to arrange for the delivery of the Sessional Address in October next.

THE PHARMACY ACT AMENDMENT BILL.

Resolutions and communications in reference to this Bill had been received from various associations and individuals, and were remitted to the Law and Parliamentary Committee.

PRELIMINARY EXAMINATION.

The Council resolved to accept the following Certificates in lieu of the Society's Preliminary Examination:—

Royal University of Ireland:—
Matriculation.
First University Examination.
Second University Examination.
Examination for a degree in Arts.

Provincial Transactions.

MANCHESTER CHEMISTS AND DRUGGISTS' ASSOCIATION.

Pharmacopœia Revision.

A meeting of the Council of this Association was held on Friday evening, June 1, to consider a communication from the Chairman of the Pharmacopœia Committee of the General Medical Council, inviting suggestions respecting the proposed new edition of the British Pharmacopœia. After full discussion, the following resolution, proposed by the Chairman and seconded by Mr. A. H. Jackson, B.Sc., was carried unanimously:—

"That whilst thanking the Pharmacopœia Committee for the opportunity afforded to the Manchester Chemists and Druggists' Association to offer suggestions regarding the proposed new edition of the British Pharmacopœia, this Council is of opinion that for the full appreciation and useful application of such suggestions as the Association might be able to make, it is essential that the Pharmacopœia Committee should include representatives of pharmacy, and it therefore awaits such an alteration in the constitution of the Committee as will give to pharmacy and pharmacists a recognized position therein."

The Secretary was instructed to forward a copy of this resolution to the Registrar of the General Medical Council and also to the *Pharmaceutical Journal* for publication.

Arrangements were made for obtaining signatures to a petition for presentation to the House of Commons in support of the memorial addressed by the Council of the Pharmaceutical Society to the Privy Council, urging the importance of establishing a Pharmacopœia Committee containing pharmacists as well as medical practitioners.

A deputation was also appointed to wait on one of the members of Parliament for the city soliciting his support.

Proceedings of Scientific Societies.

SOCIETY OF CHEMICAL INDUSTRY.

CHEMISTRY AND ANALYTICAL EXAMINATION OF FIXED OILS.*

BY ALFRED H. ALLEN.

(*Continued from page* 1009.)

The oils of class D exemplify the generality of composition of products of the most varied origin, oils from seeds, fruits, and the fat of both terrestrial and marine animals having practically identical saturation-equivalents. A slight but well-defined distinction is observable between these oils and those of class E. The results yielded by pilchard and cod oils require verification, but the figures referring to rape and castor oils have been fully confirmed by Mr. L. Archbutt. Evidently, their high equivalents are a consequence of their chief constituents being the glycerides of brassic and ricinoleic acids respectively. The calculated equivalent of the glyceride of brassic acid, existing in the oil from rape and other cruciferous seeds, is 322·67, while that of ricinolein contained in castor oil is 310·67.

In drawing conclusions from the results obtained by Kœttstorfer's process, it must not be forgotten that many of the oils of commerce contain a very sensible quantity of free acid, the presence of which, if not duly taken into account, may seriously invalidate the analysis. The free acid may be sulphuric or other foreign acid, in which case it should be removed by agitating the oil with a dilute solution of sodium carbonate before taking the known quantity for saponification. More frequently the free acid of commercial oils consists of oleic or other fatty acid, either liberated by the method employed for refining the oil, or resulting from the fermentative action

* Paper read before the London Section of the Society.

of mucilaginous or albuminous matters in the crude oil. The proportion of free acid present in commercial oils is often very large, far larger than, I believe, is commonly supposed. Thus, six samples of palm oil contained respectively 12, 21, 24, 52, 53 and 79 per cent. of free acid, calculated as palmitic acid. In fifty-five samples of olive oil intended for lubricating use, Mr. Archbutt found from 4·9 to 23·8 of free (oleic) acid, the mean being 10·5. In porpoise oil, which has been brought home in contact with the blubber, and which had drained therefrom at the ordinary temperature, I found 9·02 per cent. of free oleic acid, and in oil (from the same cargo) extracted by boiling the blubber with water, the free acid amounted to 22·65 per cent. In rape oil the proportion of free acid is generally less, ranging from 2 to 5 per cent. Cotton-seed oil, which is refined by means of alkali, is usually free from any trace of free acid.

The presence of free acid in an oil is doubtless the main, if not the only, cause of its tendency to act on metals. Hence the results published by Mr. W. H. Watson and others, showing the amounts of iron and copper dissolved in equal times by different oils, have no interest or meaning apart from the particular samples of oil examined, the action on the metals being simply a function of the free acid the oils happened to contain.

Interesting results can be obtained by exposing different samples of oils in small metal cups or shallow depressions turned out of metal plates; or the oils may be placed in small porcelain dishes, and coils of bright iron or copper wire immersed in them. When copper is employed, in the course of a day or two many samples of oil acquire a bright green colour from dissolved oleate of copper. The results are only rough, as the brown colour of many samples wholly conceals the green tint. But if the oils be shaken with ether and dilute sulphuric acid, the copper passes into the acid liquid. On separating this from the ethereal layer and adding excess of ammonia, the depth of the blue coloration produced is a fairly accurate measure of the action of the oil on the copper. This method of procedure, which was devised by Mr. L. Archbutt, is capable of being applied quantitatively, and gives very useful comparative results when employed under constant conditions.

Several rough but more or less tedious methods have been described for detecting and estimating free fatty acids in oils, but the simplest and best, and one which readily yields accurate quantitative results, is as follows:—Weigh into a 10 oz. bottle 50 grams of the sample of oil to be tested, and add to it 100 c.c. of redistilled methylated spirit, containing a little phenolphthalein, and previousiy treated with just sufficient caustic alkali to render it faintly pink. The oil and spirit are then shaken together, when, if the sample be free from rancidity, the pink colour will remain unchanged. If it be destroyed, standard caustic soda is cautiously added and the mixture again shaken, the addition of alkali being continued until a pink colour is obtained, which persists after vigorous shaking. It is easy to read to a single drop of normal alkali, each c.c. of which corresponds to 0·282 grams or 0·564 per cent. of free oleic acid in the sample. The reaction is as definite, and the neutralization point as easy to perceive, as in the titration of mineral acids; but owing to the very high combining weight of the fatty acid, great care is necessary. In assaying palm oil, which is itself often of a rose-red colour, the titration may still be made by employing a smaller quantity. In this case 5 grams of the oil and 20 c.c. of spirit are convenient quantities, and the bottle should be placed upon a white surface. It might be supposed that the proportion of free fatty acid found would be liable to be in excess of the true amount present, owing to the alkali having a tendency to partially saponify, and therefore be neutralized by the neutral oil; but this suspicion is negatived by the fact that an oil once freed from acid by the process of titration, when again treated shows no trace of free acid.

Before leaving the subject of free acid in oils I may point out that I believe that many cases of so-called "clogging" or "gumming," commonly attributed to oxidation of oils, are really due to the action of the free acids on the metal bearings of the machinery, with consequent production of soaps. One notable instance of this sort, communicated to me by Mr. Archbutt, is that of a very viscous oil which came out of a carriage axle-box. After removing a good deal of hair and dirt, the clarified oil was very green in colour, and still viscous. On shaking with ether and dilute acid the metals were readily removed, and on distilling off the ether the residual oil was found to have the same colour and viscosity as the original oil before use. In the acid liquid much copper and zinc were found. The oil was a mixture of 1 part of neutral mineral oil with 9 of olive oil containing 4·7 per cent. of free acid. It had probably been in the bearing about three weeks, yet no corrosion was "noticed." But corrosion of bearings by oils rarely is noticed, the fact seeming to be that the wear and tear of the metal and the thickening of the oil has been attributed to other causes. Liquid oils appear to corrode metals very evenly, so that the effect is not readily observed, but with solid fats it is very different. Thus, a steel rod which was immersed in axle-grease made with soap, water, tallow and palm-oil, containing a good deal of free acid, was deeply pitted in several places in a few days, and stained all over. The pittings were quite deep, and the grease after use contained only 2·8 of free palmitic acid.

The question of the action of free fatty acids on metal becomes still more important in the case of oils used for lubricating engine cylinders, or otherwise exposed to a high temperature. Under the influence of high-pressure steam all the ordinary fat oils undergo decomposition more or less readily, with formation of free fatty acids aud glycerin, and the action of the acids on the metal speedily produces an iron soap which clogs up the machinery in a very troublesome manner. It is a curious fact that the iron and magnesium soaps, and some other metallic compounds of the fatty acids, are soluble in hydrocarbon oils, though insoluble in water, the reverse being the fact with the soaps of the alkali metals. As a consequence of this, the iron soap produced in engine cylinders lubricated with tallow, castor oil, or other fat oils, gets dissolved out whenever a change is made to a mineral lubricating oil, a fact which is well known to engineers, but which has sometimes been mistaken for an abundant production of gummy matter by the mineral oil itself.

Returning for a moment to Kœttstorfer's saturation process, it is evident that the presence of any foreign matter, incapable of undergoing saponification, or otherwise neutralizing alkali, would tend to reduce the proportion of alkali required. Hence, if the nature of the oil under examination were known, the abnormal result of the titration would enable the presence of the foreign matter to be inferred, and its amount approximately estimated. But the process would give no further indication of the nature of the admixture, and hence it is frequently desirable to effect an actual separation of the adulterant or admixture from the products of the saponification of the oil itself. This can be done with great ease and accuracy by a process which I have described in detail elsewhere,* the capabilities of which have been thoroughly tested in my own laboratory, and which has given results equally satisfactory in the hands of other chemists.

The process in its most generally applicable form consists in saponifying the oil by alcoholic potash, evaporating off the alcohol, dissolving the soap in water, and removing the unsaponifiable matter by repeatedly agitating the solution with ether.† On separating the

* *Chemical News*, 44, 161.

† It is very rarely that the third treatment with ether extracts more than traces of unsaponifiable matter. The

ethereal layer from the aqueous liquid, evaporating off the ether, the residual unsaponified matter may be weighed and submitted to further examination. The following table indicates the chief probable constituents of the aqueous and ethereal layers on saponifying various fatty matters:—

Dissolved by the Ether.	*Remaining in the Aqueous Liquid.*
Hydrocarbon oils, including Shale and petroleum products.	Fatty acids, Resin acids, Carbolic and Cresylic acids — In the form of potassium salts.
Resin oil.	
Coal-tar oil.	
Vaseline.	
Paraffin wax and ozokerite.	Glycerin.
Neutral resins.	
Unsaponified oil or fat.	Excess of caustic alkali.
Unsaponifiable matter, as cholesterin.	
Myricyl alcohol, from beeswax	
Cetyl alcohol, from spermaceti.	
"Spermyl alcohol," from sperm oil.	
Colouring matters, as from palm oil.	

Of the bodies which pass into solution in ether, the hydrocarbon oils are of course intentional admixtures, and hence may vary from a trifling proportion up to a very large percentage; but when a pure animal or vegetable oil is subjected to the process, mere traces of non-volatile matter commonly pass into the ethereal solution. As a rule, the ethereal residue is under 1 per cent. of the weight of oil employed, and it very rarely exceeds 1·5 per cent. Its nature depends chiefly upon the character of the oil examined. Thus, in the case of palm oil, some of the red colouring matter is found in the ethereal extract. Butter and cod-liver oil give ether-residues which consist mainly of cholesterin, which may be obtained in characteristic crystalline tablets by warming the ethereal extract with alcohol and allowing the solution to cool.

The waxes, as a class, are well known to differ from the true fixed oils or fats, in the fact that they are not ethers of glycyl, and hence do not yield glycerin on saponification, but, on the other hand, furnish fatty acids and certain higher monatomic alcohols of the ethyl series. Thus, on saponifying beeswax, myricyl alcohol, $C_{30}H_{62}O$, is obtained; Chinese wax yields ceryl alcohol, $C_{27}H_{56}O$; while spermaceti gives cetyl alcohol, $C_{16}H_{34}O$. In the course of an investigation as to the accuracy of the process of saponification and ether-treatment for estimating hydrocarbon oils in fatty oils, I was struck with the anomalous results yielded by sperm oil. Samples of oil from several different sources, in some cases obtained direct from the importer, and of undeniable authenticity, yielded proportions of ether-residue very different from those obtained from the majority of fatty oils. Thus, while, as already stated, ordinary oils yield at most some 1 or 2 per cent. of matter to ether, sperm oil gave ether residues varying from 38 to 42 per cent., the fatty acids ranging from 60 to 65 per cent., instead of fully 95, as in the case of other fatty oils. This startling result was fully borne out by the results obtained when using Kœttstorfer's process for the examination of sperm oil, the proportion of alkali neutralized being much less than in the case of ordinary oils. Of course the analytical results yielded by sperm oil pointed to a very different constitution from that of ordinary oils, a fact which was observed by Chevreul as long ago as 1823, who writes of sperm oil as yielding, by saponification, margaric acid, oleic acid, and "a non-acid fatty matter fusible at about 20°, which appears to be a congener of ethal"—the monatomic alcohol of spermaceti.*

From these results it appears probable that sperm oil ought to be classed with the waxes rather than with the true fixed oils. Until recently sperm oil was the only natural product known to me which was fluid at ordinary temperatures and yet had a constitution apparently similar to that of the waxes; but during the last autumn I was called on to make an examination of the oil from the bottle-nose whale, several cargoes of which have been recently disposed of. The blubber is brought home in tuns, and the oil is extracted from it in the ports on the eastern coast of Scotland by boiling with water, heated by means of steam. The oil is run off and allowed to stand so that the water may separate. On cooling to about 10° C. it gives a notable quantity of "foots" or deposit. This "foots" consists in reality of crude spermaceti, and a sample which I examined yielded me 60 per cent. of the refined wax. I have also a specimen, broken off a large cake, of very finely crystallized spermaceti, which was extracted from bottle-nose oil by a well-known firm. I may here remark that the statement often met with in books that spermaceti is found simply in the head cavities of the sperm whale is a mistake, the fact being that it is obtained from the oil of the blubber and all parts of the body whenever there is a sufficient reduction in the temperature. Specimens of sperm oil and bottle-nose oil, which are quite clear at 10° C., give a further deposit of spermaceti at a lower temperature, but the separation appears to be almost wholly complete at 4° C. The oil from the bottle-nose whale gives, on subjection to saponification and ether extraction, results almost absolutely identical with those yielded by the oil from the true sperm whale, the ether residue varying from 38 to 41 per cent., and the fatty acids from 60 to 65 per cent. In viscosity, behaviour with sulphuric acid, and in fact generally, bottle-nose oil gives results practically identical with sperm oil. It is, however, worthy of remark that the blubber of the sperm whale is commonly boiled down for extraction of the oil immediately after the death of the animal, whereas the bottle-nose oil which has hitherto appeared in the market has been prepared by boiling the blubber after it has arrived in England, and when it has undergone more or less putrefactive change. As a consequence, commercial bottle-nose oil commonly contains from 1 to 2 per cent. of free fatty acid, which causes it to act somewhat vigorously on copper, but when properly refined this objectionable tendency is wholly removed. Such oil would appear likely to prove a very valuable substitute for sperm oil. At the same time it is worthy of attention that in certain cases in which sperm and bottle-nose oil are said to have been used under strictly parallel conditions, the bottle-nose oil has been found defective, but the oil thus found wanting had undergone no refining beyond simple filtration, and was probably more or less rancid. Besides, there is the significant fact that bottle-nose oil has been extensively mixed with or substituted for sperm oil without acknowledgment, and yet the users do not appear to have found fault with it.†

The exact nature of the ether extracts from saponified bottle-nose and sperm oils is an interesting subject for future investigation. The two products differ slightly in fusibility, but appear to be almost identical. They distil at a high temperature, apparently without decomposition, and condense to a liquid as colourless as water, which, on cooling, forms a white crystalline solid. From the ether

fact that repeated treatment is requisite at all is probably due to the very considerable solubility of ether in solutions of soap. Petroleum spirit and chloroform do not readily separate from alkaline liquids.

* *Recherches Chimiques sur les Corps Gras d'Origine Animale*, p. 238.

† The curiously-close resemblance in the chemical and physical characters of sperm and bottle-nose oils renders their anatomical relationship of interest. Huxley classes the true sperm whales (*Physeter*) and the bottle-nose whales (*Hyperoodon*) in the same family of *Physeteridæ*; the dolphin, porpoise, grampus and narwhal belonging to a separate family (*Delphinidæ*).

residue of bottle-nose oil I have obtained a body giving on combustion figures agreeing fairly with the formula $C_{12}H_{26}O$, but this is not the only substance present.*

The oils from the sperm and bottle-nose whales having yielded such curious results, it appeared of interest to ascertain the chemical nature of the oils from other cetaceans. As a preliminary guide the specific gravity of the oil is a useful indication, for while the great majority of fixed oils have a density exceeding ·914, sperm and bottle-nose whale oils show a density of about ·880 only, and hence the gravity may be regarded as showing whether the oil is a glyceride or a liquid wax. On applying this test, it is found that northern and southern whale oils and porpoise oil have a density of fully ·920, and on saponification they yield about 95 per cent. of fatty acids, and only 1 per cent. or so of ether residue. They may therefore be safely regarded as triglycerides. There are, however, two oils known in the market as "shark-liver oil" and "African fish oil." In the former case the name sufficient'y indicates its origin, but I am not certain of the animal or animals which yield the latter oil. The basking-shark or sunfish (*Squalus maximus*) is the species from which shark oil is most commonly obtained. As far as I have at present ascertained, "African fish oil" has a constitution similar to that of shark-liver oil. These two oils are fully as light, and even lighter, than sperm and bottle-nose oils. Although in the case of shark-liver oil, at any rate, the oil is not derived from a cetacean, I fully expected it would prove to have a constitution similar to that of sperm and bottle-nose oils. I am not yet prepared to say anything definite respecting it, for the simple reason that it has hitherto resisted every attempt to saponify it. I have tried to effect its decomposition by aqueous potash, by a solution of potash in absolute alcohol, by heating it with solid potash to 200° C., and by treatment with moderately strong sulphuric acid. In some cases the experiments have been made under the ordinary atmospheric pressure, and in others in sealed tubes at temperatures varying from 100° to 150° C. So far I have been unsuccessful; at least the shark oil has yielded over 80 per cent. of unsaponifiable matter to ether. Whether this result be due to the remarkable difficulty of saponifying the oil remains to be seen; but I am inclined to suspect the anomalous behaviour to be due to quite another cause, namely, that the oil consists in large proportion of a body allied to cholesterin, but fluid at ordinary temperatures. That an oily liquid obtained from the liver of an animal should contain a large proportion of a cholesterinoid body is not on the face of it improbable.

(*To be continued.*)

CHEMISTS' ASSISTANTS' ASSOCIATION.

At the Annual Meeting of this Association held on Wednesday, May 16, the following Report of the Council for the session ending April 30, was read and adopted.

Report.

"The Council has pleasure in presenting the Annual Report of the sixth session. The Association numbers 90 ordinary and 17 honorary members, 55 new members having been enrolled du-ing the session, showing an increased numerical strength of 29 for the current year.

"It is gratifying to note, that the financial position of the Association is highly satisfactory, as will be seen by the accompanying balance sheet.

"Your Council perceives with satisfaction that the departure from the custom of past sessions and the adoption of more frequent meetings have realized its most sanguine expectations; it is enabled to chronicle 22 ordinary meetings, with an aggregate attendance of 508 being an average of 23.

"The issuing of the programme in two parts (Octob and January) has also proved advantageous, and with one exception the papers have been contributed by members of the Association, as follows:—W. Elborne, H. H. Millhouse, F. H. Alcock, H. Cracknell, R. Winfrey, C. E. Stuart, B.Sc., W. A. Wrenn, W. T. Cooper, jun., C. Thompson, C. E. Palmer, C. L. Wyatt, W. R. Dodd, R. W. Giles.

"Five social meetings have also been held, and an evening devoted to the discussion of a resolution approving in the main of the Draft Pharmacy Acts Amendment Bill.

"A Conversazione held at St. James's Hall in November was well attended, and the Annual Dinner held in February, under the Presidency of Michael Carteighe, Esq., supported by Dr. Langdon Down and several leading pharmacists, was successful in a marked degree.

"Your Council, taking into consideration the expense incurred each session by hire of pianoforte, has thought it wise to purchase one, and trusts this addition will be fully utilized and appreciated.

"In conclusion, your Council tenders its sincere thanks to the authors of papers, and to all those who have in any way contributed towards making the session so successful. The primary object of the Association has been in a large degree attained, and it is hoped the incoming Council will receive that support from members generally which will enable it to maintain and augment the usefulness of the Association."

The following gentlemen were elected members of the Council for the ensuing year:—Messrs. F. A. Alcock, J. O. Braithwaite, W. T. Cooper, jun., H. Cracknell, W. R. Dodd, J. H. Hartridge, H. H. Millhouse, C. Parkinson, T. F. Perkins. G. S. Snow, C. Thompson, R. Winfrey, and W. A. Wrenn.

Obituary.

Notice has been received of the death of the following:—

On the 3rd of February, Mr. Nicholas Curry, Chemist and Druggist, Spennymoor, Durham. Aged 24 years. Mr. Curry was an Associate in Business of the Pharmaceutical Society.

On the 15th of May, Mr. William Waples Leete, Chemist and Druggist, Herne Hill. Aged 46 years.

On the 20th of May, Mr. Charles Hadfield, Chemist and Druggist, Mill Street, Macclesfield. Aged 68 years.

On the 20th of May, Mr. Thomas Thompson, Pharmaceutical Chemist, Market Place, Richmond, Yorkshire. Aged 61 years. Mr. Thompson had been a Member of the Pharmaceutical Society since 1850.

On the 24th of May, Mr. William Hutchings Brooks, Chemist and Druggist, Shadwell, E. Aged 49 years. Mr. Brooks had been a Member of the Pharmaceutical Society since 1869.

On the 27th of May, Mr. John Hampton Davies, Chemist and Druggist, Kensington, Liverpool. Aged 38 years.

On the 27th of May, Mr. George Henry White, Chemist and Druggist, Mountain Ash, Glamorganshire. Aged 44 years. Mr. White had been a Member of th Pharmaceutical Society since 1870.

* Cetyl-alcohol produced by the saponification of spermaceti contains $C_{16}H_{34}O$; but there is some evidence that lower and higher homologues are also present. Similarly, the alcohol from bottle-nose oil appears to consist chiefly of $C_{12}H_{26}O$. At the time I read this paper I imagined the discovery of this alcohol, and of the constitution of bottle-nose oil,to be new, but my attention has since been called by Mr. W. H. Deering, to the researches of Scharling, who in 1847 described the oil as consisting mainly of the doeglate of doeglyl, having the composition $C_{12}H_{25},C_{19}H_{35}O_2$. This formula corresponds curiously closely with the proportions of ether residue and fatty acid yielded by the saponification of bottle-nose oil. I intend to make a further examination of the constituents of sperm and bottle-nose oils.

Review.

THE MEDICAL MAN'S HANDY BOOK. Edited by WILLIAM SHEPPERSON. London: J. and A. Churchill.

This is a little compilation for which we see no *raison d'être*. The bulk of the book is made up of a list of incompatibles and a table of doses. Thrown in with these are three tables from Barber and one from Attfield, a posological table for different ages, and some antidotes to poisons.

Mere lists of incompatibles are simply useless. A knowledge of incompatibility should depend upon a knowledge of the principles on which incompatibility depends, and it is often the case that those things which are put down by an author as incompatible are designedly brought together by the medical man who knows his work. Thus in Mr. Shepperson's table we find that "hydrargyri perchloridum corrosivum" is incompatible with iodide of potassium. We venture to say thousands of gallons of mixture containing these two substances are during the year prescribed, and advisedly prescribed, by medical men. What does it matter to the prescriber if iodide of potassium and perchloride of mercury give a red precipitate when mixed in certain proportions? He knows that when mixed in the proportion in which he always prescribes them they will form a clear solution and that that solution has a definite effect. The following are singularly useless statements of incompatibility:—"Cassia fistula with alcohol;" "camphora with strong sulphuric and nitric acids;" "ferri sulphuretum with acids which unite with iron;" "sulphur with boiling solution of soda;" "benzoinum with the acids and alkalies;" "cannabis indica with waters and watery infusions." The author surely does not mean that no preparation of cannabis indica can possibly be prescribed in a watery vehicle.

Another absurdity in the book is making some antidotes absolute which are simply retardants. Thus vegetable astringents are given, without qualification, as antidotes for antimony and its salts, and hydrated peroxide of iron (recently made) for arsenic and its compounds. Soon after this we are told to use the stomach pump for barium and its salts. The only inference to be drawn from this is that a cup or two of tea is all that is required in antimony poisoning and that doses of ferric hydrate given freely destroy the poisonous activity of arsenic.

The table of doses looks useful from the fact that doses of unofficial drugs are given; but its value is greatly impaired by the fact that the strengths of the unofficial preparations, such as tinct. lactucarii, tinct. gelsem. semper., etc., are not given with the doses. The full dose of croton chloral is given as 3 grains. We have much more frequently seen 10 grains prescribed.

The pill excipients are not worthy of notice, excepting perhaps that ung. resinæ is recommended as a pill excipient for ferri et quin. cit. Altogether the book is fairly harmless, but absolutely useless to any pharmacist worthy of the name. It is addressed to medical men, and the editor expresses a hope that it "may find a place among other books of reference on the consulting-room table." We can only hope that our own family doctor's knowledge is not of such a kind that he has to run to a production like this for information.

BOOKS RECEIVED.

LECTURES ON PRACTICAL PHARMACY. By BARNARD S. PROCTOR. Second Edition. London: J. and A. Churchill. 1883. From the Publisher.

THE VEGETABLE MATERIA MEDICA OF WESTERN INDIA. By W. DYMOCK. Part I. London: Trubner.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

THE SALE OF BUTTER OF ANTIMONY.

Sir,—In your issue of June 2, I observe an editorial note calling attention to the case of poisoning by butter of antimony, recorded by me in the *Lancet*, of May 19, in which death followed within two hours after the poison was swallowed.

In the report of the case, I ventured to call attention to the importance of restricting the sale of this corrosive fluid, and mentioned the fact that it was not scheduled under the "Poisons Act." Since then I have been in communication with Mr. Mundella, in reference to the subject, and I have every reason to believe that although as you remark "the Privy Council has recently refused to sanction its introduction into the second part of the schedule," my suggestion will be carefully considered, and probably adopted.

Under present circumstances, it is possible for a farm labourer to purchase for a few pence a sufficient quantity of this dangerons article to poison a mistress or illegitimate child, if he be so disposed, under the pretext of using it for "foot rot" in sheep.

It is a "dynamite" of its own for evil purposes, and may easily be administered to murder unsuspecting persons, in milk, gruel, tea or treacle without their being sensible of its deadly properties.

R. BARRINGTON COOKE,
Consulting Surgeon, Royal Northern Sea Bathing Infirmary.
Scarborough.

THE PURITY OF SODIUM NITRITE.

Sir,—In the "Month," in your last week's issue, you quote, from the *Practitioner* for March, some remarks of Dr. Matthew Hay on the purity of sodium nitrite, which he recommends for angina pectoris. Dr. Hay states that he has some difficulty in obtaining the salt pure, that even when obtained from a London manufacturer of the highest eminence he only found it to contain 33 per cent. of nitrite, and that another specimen only contained a trace.

This experience is the more remarkable because as a matter of fact sodium nitrite is one of the purest salts to be met with in commerce. I buy and use many tons annually and have no difficuity in obtaining it guaranteed to contain 98 per cent. of real nitrite, the 2 per cent. of impurity consisting chiefly of moisture.

Dr. Hay says that the purity of the salt is easily estimated by means of a standard solution of permanganate of potassium. This is, of course, perfectly true, but the estimation gives unreliable results if certain essential precautions, which will readily suggest themselves to the experienced operator, are not taken into account. Even supposing, however, the possibilty of error in the estimation, this will hardly account for the presence of only a mere trace.

With reference to the contemplated new edition of the Pharmacopœia, and considering the purity and cheapness of sodium nitrite as now met with in commerce, I suggest the return to the old process of making spirit of nitrous ether from it as giving better results and presenting other advantages over the present B.P. process.

CHARLES EKIN.

"*Inquirer.*"—(1) *Cardamine pratensis*; (2) Probably *Cochlearia angelica*: send lower leaves; (3) Send another specimen; (4) *Vicia sativa*; (5) *Lathyrus macrorrhizum*; (6) *Asperula odorata*; (7) Send a better specimen, in fruit; (8) *Ballotta fœtida*, probably: send a specimen in flower; (9) *Lotus corniculatus*; (10) *Polygala vulgaris*; (11) *Viola tricolor*; (12) Send a specimen, in flower.

R. Roberts.—Nos. 1 and 2 are named correctly; No. 3 is *Saxifraga granulata.*

COMMUNICATIONS, LETTERS, etc., have been received from Messrs. Postans, Davies, Summers, N.D.

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Great Saving in the purchase

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Before ordering the above see our newly Reduced Price List, which is forwarded free on application; also for Blue Poison Bottles, Round Shouldered Phials, Castor Oil Bottles, Flat Pannelled Bottles, Direct Square Dispensing Bottles, Citrate of Magnesia, Essence Bottles, Pomade Bottles, and all other kinds.

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The next Session of this School will commence on Monday, September 3, 1883, and the Principals will be glad to have an early intimation from Students who intend joining at that date. The lectures given at this School are delivered in as practical a manner as possible, and specimens are provided for the Students at the Practical Botanical Classes free of cost.

PRIVATE TUTOR

Mr. JAS. W. SAUNDERS

(*From the Royal School of Mines*),

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SIX of my Students presented themselves at the April Minor, **FOUR** passed—all at their first attempt. Those wishing to attend my "practical demonstrations" for the June or July Minor are requested to apply, as my few vacancies are fast filling. **PERSONAL TEACHING. NO DEMONSTRATORS.** Postal Instruction. Enclose stamp for particulars; or "at home" daily from 1.30 to 2.30.

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The next Session will commence on Monday, September 3rd.

Students desiring to enter the School at the commencement of the Twelfth Session, on 3rd September, should send in their names without delay, as the few remaining benches in the Laboratory are being rapidly filled up. The regular course is three months, but those already possessing knowledge may enter at any time when there is room.

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To the October Examination ...	£2 2s.
Until Qualified	£5 5s.

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To the October Examination ...	£5 5s.
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The next Session of this School will commence early in August, so as to allow time to prepare for the October Examinations. It will include, besides the usual Day and Evening Classes and Lectures for the Minor, an Afternoon Class for the December MINOR, and an Afternoon Class for the January PRELIMINARY. Fee for either class, £4 10s.

Mr. TURNER has been requested to conduct these Classes by local students who are not able to attend the regular Classes, and he thinks they will be of service to others who are similarly circumstanced.

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PRELIMINARY.—Arithmetic and Metric System, 1s. How to Write an Essay, 6d. Latin Grammar and Cæsar Simplified, 1s. MINOR.—Equations Simplified, 1s. Illegible Autograph Prescriptions, 1s. Minor Questions, 1s. Notes on Dispensing, 1s. Prescriptions given at the Minor, 1s. For "How to Prepare for either Exam.," enclose stamped envelope, CHEMIST, care of Mr. J. Edwards, Wye, Kent. Herbarium of Plants, 6s.

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Director: Dr. JOHN MUTER, M.A., F.I.C., F.C.S., &c.

FOURTEENTH SESSION, 1883-4.

Entries now being made for the 10th September. Fees, Syllabus, &c., apply to W. BAXTER, Secretary.

ENGAGEMENTS WANTED.

AS Surgeon's DISPENSER, Chemist's ASSISTANT, or in Wholesale Drug trade. Age 30. 7 years with Chemists. 6 years at Dispensary. Good references. C. C. F., 1, Westbourne Ter., Cheltenham.

END of June.—By competent Dispenser and Tooth Drawer. Near London preferred. Satisfactory references. State salary given, and if any Sunday duty. FRANK BELLAMY, Church St., Falmouth.

AS ASSISTANT in a good Dispensing business. West-end experience. Major qualification. Age 23½ years. Height 5ft. 10in. Satisfactory references. BETA, 134, Lisson Grove, N.W.

AS JUNIOR in a good Dispensing business. Age 21. 6 years' experience. Height 5ft. 10in. T. J. ADDIS, 11, Argyle St., Bath.

AS ASSISTANT. Accustomed to good class Dispensing and light Retail. Permanency. In London. About 1st July. In or out-door. Good references. Preliminary qualifications. Age 22½. Height 5ft. 6in. 7 years' experience. Total abstainer. WM. HUTCHISON, Woodbush House, Dunbar.

LOCUM TENENS.—Mr. W. B. WEST, Staines Rd., Hounslow. 30 years' town and country experience and unexceptional references as Temporary Manager extending over the last 12 years.

AS Temporary ASSISTANT or MANAGER. For either town or country. Experience in Dentistry and Prescribing. Married. Good references. D., 19, Wandle Rd., Croydon.

AS MANAGER, by a Pharmaceutical Chemist with extensive and varied experience. Highest references. Would accept a short engagement. PHARMACEUTIST, 50, High St., Windsor.

AS Temporary MANAGER or ASSISTANT. Out-door preferred. Good experience and references. Disengaged. A. P. S., 17, Market Pl., Horncastle.

TEMPORARY. Ætat. 31. By day, week, or month. Town or country. Thoroughly experienced in all branches. Terms very moderate. Irreproachable references. A. WOOD, 4, Woodfield Cres., W.

AS ASSISTANT in a first-class Retail and Dispensing business. Age 24 years. Height 5ft. 10in. 9 years' experience. Good references. H. F. F., Mr. Woodward, High St., Huntingdon.

AS JUNIOR. Age 20. 5 years' experience. Good references. CHEMICUS, 5½, Halford St., Leicester.

WHOLESALE.—As ASSISTANT. Age 23. Nearly 8 years' experience in both Wholesale and Retail. A permanency required. A., 10, Vine Grove, Chapman St., Hulme, Manchester.

AS MANAGER or SENIOR. Age 35. Well up in Retail, Prescribing, Dispensing and Dentistry. Town and country experience. R., 16, Benwell Rd., Drayton Pk., N.

ENGAGEMENTS WANTED.

AS Assistant. Nearly 7 years' experience in first-class Dispensing. Age 20. Height 5ft. 11½in. Particulars of duties, salary, &c., to Delta, 25, Elton Pl., Bishopston, Bristol.

TEMPORARY Assistant or Manager. Town or country. Registered. Long experience. Good references. L. T., 141, Kentish Town Rd., N.W.

AS Assistant or Manager. 10 years' experience. Would take charge for a term. Extract Teeth. Minor qualification. London preferred. Age 26. M. A., 92, Third Avenue, Queen's Park, W.

WHOLESALE.—By a gentleman, qualified, as Traveller (town or country), or would not object to responsible position in Warehouse. Good references and security. R. C., 2, Wellington Rd., Peckham, S.E.

MANAGER of Branch, or for widow, or for company. Registered. Age 44. Married. 26 years' experience in country business; last 19 at Bury St. Edmunds. Unexceptionable references. G. J. B., 25, Well St., Bury St. Edmunds.

AS Dispenser to a Surgeon. In London, or within 20 miles. Considerable experience, and a total abstainer. L. C., care of A. J. J. Chitty, Esq., Surgeon, Dedham, Essex.

AS Improver. Only small salary required. Good business, with comfortable home and time for study. Nearly 3 years' experience. Age 23. E. Shaw, Beech Avenue, Nottingham.

AS Assistant. Where several are kept. Major qualification. Age 23. C. G. C., 24, Holland St., Kensington.

AS Assistant. Town or country. 8 years' London experience. Age 23. Height 5ft. 10in. Out-door preferred. C. Bell, 37, St. Mary's Rd., Hastings.

AS Temporary Manager. Disengaged until June 23rd. Town or country. First-class references. J. H., 4, Shaftesbury Ter., Hornsey Rise, N.

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AS Junior Assistant. Where two or more are kept preferred. Age 20. 4 years' experience. Height 5ft. 8in. Excellent references. State salary, &c. Chemicus, 4, Berkeley Avenue, Cheltenham.

TEMPORARY. Disengaged about July 3rd. Good references. G. P. Harold, Battle, Sussex.

FOR 6th of July. Junior or Improver. Age 21. Height 5ft. 3in. 4 years' experience. F. B. I., 28, London Rd., Lowestoft.

EVENING employment. Moderate salary. B., 8, Duchess St., Portland Place.

SEASIDE.—Pharmacist who has sold his business, wishes engagement for the season. Out-door preferred. First-class experience. X. J., Mr. Naylor, 44, Eastcheap.

AS Improver or Junior. Age 19. Good address. London experience. Improvement of more object than salary. H. B., 66, Compton Rd., Wolverhampton.

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IMMEDIATELY.—Good Junior, for suburban business. Not under 21. Salary £40, with increase. Apply, A. B., care of Messrs. Davy, Yates & Routledge, 64, Park St., Southwark.

A GENTLEMANLY Assistant. One wishing to study and able to Extract Teeth preferred. Send carte, if convenient, and all particulars, to Chemist, 4 and 5, Church Pl., Leytonstone.

ASSISTANTS WANTED.

AN Assistant. Out-door. Apply, Pond, 68, Fleet St., E.C.

IN-DOOR Assistant, with Minor qualification. Accustomed to good class trade and Dispensing. Apply, with usual particulars and reference, to Jno. Hallaway, Carlisle.

A JUNIOR Assistant. To live out-door. Business closes 6.30 p.m., 4 o'clock on Saturdays, and no Sunday duty. Good opportunity for student living in London. Small salary. Address, R. H. C., 20, Royal Exchange, E.C.

MESSRS. A. HEATH & CO., Homœopathic Chemists, 114, Ebury St., require a Junior Assistant. Out of doors. Apply by letter, stating age, &c.

AN Assistant. Apply, stating age, references, and salary required, enclosing carte, to G. Brookes, Medical Hall, Llandudno.

FOR India.—A qualified Assistant. Not over 30. One accustomed to Mixed country business, with some London experience preferred. Salary on 3 years' agreement. In-doors. Rs. 1000, 1200 and 1400, with good prospects and free passage both ways. T. H. W., Idris & Co., Ascham St., London, N.W.

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A STEADY, competent Assistant. Accustomed to good class Retail, Dispensing, Prescribing and Tooth Extracting. Apply, with full particulars, and send carte (to be returned), W. J., Messrs. Meggeson & Co., Miles Lane, Upper Thames St., London.

A JUNIOR or Improver. In-doors. With a good recommendation. Must have been apprenticed to the Drug trade. State with whom last, how long, salary, height. If a carte, forward (shall be returned), but personal application preferred, before 11 or after 7, to G. Morris, Chemist, Green Lanes, Highbury New Park, London, N.

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A DISPENSER, to assist on out-patient days, at the Royal Berks Hospital. Salary £30 a year. Who would probably be able to obtain additional employment in one of the Surgeries of the town. Applications, with testimonials, to J. T. Hugo, Secretary, Royal Berks Hospital, Reading.

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FRANCE.—An ASSISTANT, of gentlemanly appearance and good address, qualified, speaking fluently the French language. Must be an experienced Dispenser, and accustomed to first-class Retail. The most unexceptional references are required. Apply by letter to M. THOMAS, 224, Rue Rivoli, Paris, Galignani's Messenger. Enclose photo., height, age, references, and salary, out of doors.

APPRENTICESHIP vacancy.—W. W. CLARK, Pharmaceutical and Family Chemist, High St., Dorking, Surrey, has a vacancy for a well educated, gentlemanly youth as an APPRENTICE. A comfortable home and every facility for obtaining a thorough knowledge of the business. Particulars on application.

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A JUNIOR ASSISTANT in a Mixed trade. Hours of business, 7.30 a.m. to 8 p.m. State age and salary required to Executors of R. Robinson, Lockwood, Huddersfield.

IMMEDIATELY.—A JUNIOR. Apply personally, or send full particulars, with carte if possible, to A. JOHNSON DYER, Pharmaceutical Chemist, 6, Acre Lane, Brixton, S.W.

IMMEDIATELY.—An ASSISTANT, with Minor or Apothecaries' Hall qualification. Apply, stating salary required (out-door), references, &c., to GOSTLING & Co., Diss, Norfolk.

A GENTLEMANLY and steady young man as JUNIOR or IMPROVER. Apply, with full particulars, to A. E. EKINS, Pharm. Chemist, Market Pl., St. Alban's.

LABORATORY MAN. Must have had experience in Wholesale Manufacturing, possess a thorough knowledge of his business, and be qualified. Apply in writing, stating age, salary required, and experience, to S. C. D., care of Baiss Bros., 4, Jewry Street, Aldgate, London, E.C.

CLERK and BOOKKEEPER. In-door. An increased salary to one who can write shorthand. Apply, M. B., care of Messrs. Horner & Sons, Mitre Sq., Aldgate, London, E.C.

A GENTLEMANLY and steady young man, as JUNIOR or IMPROVER. Capable of taking management during occasional absence of principal. Must be well recommended. State age, height, salary, and experience, with carte, to JOHN LEA, Folkestone.

A THOROUGHLY competent ASSISTANT. About 22. One accustomed to first-class Dispensing. Five others employed. Apply, personally if possible, to W. THOMAS, 103, Talbot Rd., Bayswater, W.

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ASSISTANTS WANTED.

TO Dispensers.—An Assistant DISPENSER for the St. George's and St. James's Dispensary, to attend daily from 11 o'clock a.m. to 2 p.m., or until the Dispensing is finished. Applicants for the appointment are requested to send their letters of application and testimonials to the SECRETARY at the Dispensary, 60, King St., Golden Sq., W., not later than the 19th of June instant, and to attend personally at the Dispensary on Thursday, the 21st of June instant, at 4.30 o'clock p.m.

A JUNIOR ASSISTANT. A moderate salary. A very comfortable home. Apply or write to W. S. BARTON, 1A, Moreton St., Pimlico, S.W.

A THOROUGHLY competent ASSISTANT, to give part of his time, evenings or 2 or 3 days a week. Apply to Messrs. HOOPER & Co., 24, Russell St., Covent Garden, London.

IN a good class Mixed country trade, a steady and obliging ASSISTANT. Age about 22. Hours 8 to 8. No Sunday work. Comfortable home. References as to sobriety, &c., must be unexceptionable. Preference given to those enclosing photo., to be returned. Salary, references, and particulars, to WRIGHT, Chemist, Olney.

A THOROUGHLY competent ASSISTANT. Of gentlemanly appearance and address. Chiefly for the Dispensing department. In a first-class business on the South Coast. Two assistants and two pupils employed. Full particulars and carte to B. K. EARNSHAW, The Royal Pharmacy, Eastbourne.

JUNIOR ASSISTANT. A Pharmaceutical Chemist living in a pleasant suburb, 20 minutes by rail from Bloomsbury Square, has a vacancy for a gentleman of good appearance and abilities. Preference given to one who has just completed his apprenticeship in a good class country Dispensing business, and who is preparing for Minor exam. Time for study. Apply by letter, stating full particulars, to T. H. BATEMAN, 2, Cavendish Ter., Brondesbury, N.W.

AN ASSISTANT, well acquainted with Homœopathic Dispensing and Pharmacy. R. WILLIAMS & Co., 121, Western Rd., Brighton, W.C.

AN ASSISTANT. About 23 or 24 years of age. Must be a reliable Dispenser and accustomed to good class trade. One only kept. Apply personally if possible, if not, enclose carte, with full particulars, to POCKLINGTON & Co., Pharm. Chemists, Upper Sydenham.

AN ASSISTANT. About 24. In-door. For general Retail and Dispensing business. Apply personally, or if by letter enclose carte, to E. R. MARSH, 49, Chippenham Rd., Paddington, W.

IMMEDIATELY. — For season. AN ASSISTANT. From 23 to 30. Well up in Dispensing and first-class Retail. Apply, enclosing carte, names of references, and salary required, JAMES B. CARR, 37, High St., Weston-super-Mare.

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A COMPETENT ASSISTANT. Must be an experienced Dispenser, and of good address. Age about 23. One seeking a permanency preferred. Apply personally, if possible, to F. W. ROUSE, 114, High St., Clapham, S.W.

AN ASSISTANT. In-door. About 21 or 22 years old preferred. For good country business. State age, height, salary required, and particulars, also send photo. KEMP & SON, Chemists, Horncastle.

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DRUG Trade.—Invoice Clerk. Must be a good and quick writer, and have had previous experience of the trade. Apply by letter only, stating age, salary required, and previous employ, to T. & C., care of Messrs. G. Street & Co., 30, Cornhill, E.C.

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R. DUNN, Chemist, Bath, requires a well educated Assistant, of good address, and well up in Dispensing. Applicants please state full particulars.

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A GOOD Junior. About 22. State age, height, salary expected, &c., and enclose photograph, to J. W. Taplin, 13, Desborough Pl., Harrow Rd., W.

BUSINESSES FOR DISPOSAL.

SAINT Bees, Cumberland. — For sale, owing to the death of the owner, the Business of a Chemist and Druggist. Established upwards of 25 years. Connected with the shop is the sale of books and stationery to the college and students. No opposition. Will be sold as a going concern. For particulars apply to J. Webster, Solicitor, Whitehaven.

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MESSRS. TAYLOR & CO., 38, Walbrook, City, are instructed to find a purchaser for a good old established Business in one of the best positions in Birmingham. Returning now, under management, nearly £1000. Price £500 to an immediate cash purchaser. Messrs. T. & Co. have two or three exceptional bargains for disposal, and invite intending purchasers to favour them with a call.

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BUSINESSES FOR DISPOSAL.

A GENUINE Retail, Dispensing and Prescribing Business, with Teeth Extracting. In a pleasant part of Norfolk. No other chemist for 6 miles. Returns about £400. Profits more than half. Rent £18. Great scope for increase. Cash price £300. Address, Chemicus, 7, Sydney Ter., Addiscombe Rd., Croydon, Surrey.

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WANTED TO PURCHASE.

A GENUINE Dispensing and Retail Business. Either in good market town or suburb of London. Returning £1000 up to £1600. Particulars, in confidence, to Standard, care of Messrs. Meggeson & Co., 14, Miles Lane, Upper Thames St., E.C.

A RETAIL and Dispensing Business. Returning from £800 to £1200. In the suburbs (or within 50 miles south) of London. Send full particulars, which will be treated in strict confidence, to R. Scrase, Chemist, Putney, S.W.

A GOOD class Retail and Dispensing Business. Returning £1200 to £1800. Convenient house and good locality essential. Principals only, with full particulars, in confidence, to M., 2, Westow Hill Ter., Upper Norwood, S.E.

A DRUG Business. By a thorough enterprising, active, and good business man. Has capital at command. Or would take an active Partnership, wholesale or retail. Locality no object. Communications solicited in confidence. J. L. Williams, Post Office, Birmingham.

A GOOD class Dispensing and light Retail Business. Returning from £1200 to £2000. Within easy distance of London or suburbs preferred, but not particular as to locality or county if a genuine and reliable business offers. Cash ready. Particulars, in strict confidence, to Pharmacist, 5, South Lambeth Rd., London. S.W.

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Containing particulars of about 250 Businesses for disposal, ranging in price from £50 to £2500, may be had on application.

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Appointments for valuations should be made as early as possible.

T. & Co. having been actively engaged for upwards of 20 years in the trade, vendors and purchasers consulting them have the advantage of their extensive and varied experience.

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Member of the Pharmaceutical Society,

CHEMISTS' TRANSFER AGENT,

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Henry Gadd having had many years' practical experience of the Trade, both in Town and Country, can offer his services for Transfers, Probate, Valuations, Arbitrations, &c. Gentlemen requiring businesses in LONDON or COUNTRY, from £100 to £2000, are requested to write for particulars, stating amount prepared to invest, and size of business required. No charge to purchasers.

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F. J. BRETT'S practical knowledge of the trade in all its branches renders him specially adapted to act as trustee in Liquidations and Bankruptcies. Chemists in difficulties can have their affairs settled by private arrangement.

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LIVERPOOL.—Returns last year £750. Light Retail, Dispensing and PRESCRIBING. Price £350.

LIVERPOOL.—Dispensing, Retail and PRESCRIBING. In prominent position. Returns £500.

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NORTHAMPTONSHIRE.—Unopposed village RETAIL. Doing profitable Sheep Dipping trade. Returns £700. Price £500.

YORKS.—Unopposed village RETAIL. Returns £600 to £700. Has done, with personal attention, £900. Price £400. A bargain.

SOMERSET.—First-class Retail and Dispensing. In fashionable watering-place. Returns £700. Price £700.

GLOUCESTERSHIRE.—First-class Retail and DISPENSING. In suburb of fashionable town. Excellent house and shop. Returns £750. Price £750.

Transfers, Valuations and Auctions conducted throughout the United Kingdom by Mr. BRETT, Leicester.

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A HANDSOME lot of Shop Fixtures and Glass Cases, including Spanish mahogany Counters, fitted with drawers underneath, and hundreds of mahogany-fronted chemists' Drawers at 2s. per drawer, secondhand Wall Cases and Fixtures of every description, Dispensing Screens, from 6ft. long, with cases at each side, plate-glass doors, mirror backs, shifting shelves and red velvet trays to cases, marble slab and plate-glass mirror in centre, with tablets and carved wood on top, fitted with three long shelves at the back, £7 10s. All these second-hand fixtures are a great bargain and in beautiful repair. Messrs. J. & W. BYGRAVE, 12, Curzon St., Wenlock St., Hoxton, London, N.

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The Business conducted by Messrs. ORRIDGE & Co. has been known as a Transfer Agency in the advertising columns of the PHARMACEUTICAL JOURNAL since the year 1846, and is well known to all the leading firms in the Trade.

VENDORS have the advantage of obtaining an opinion on Value, derived from extensive experience, and are in most cases enabled to avoid an infinity of trouble by making a selection from a list of applicants for purchase, with the view of submitting confidential particulars to those alone who are most likely to possess business qualifications and adequate means for investment.

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1. LONDON, N.—In a good class locality. A very old established Retail and Dispensing BUSINESS. Held by vendor 30 years. Returns £800 yearly. Good house, on lease. Rent only £55. Price to be arranged.
2. LONDON.—Within easy distance of Bank of England. Retail, Dispensing and Prescribing BUSINESS. Returns £1100 yearly, and gradually increasing. Illness cause of sale. Large house. Rent £75; part let off. Price about £950.
3. LONDON SUBURB, S.E.—In an improving locality. Retail and Dispensing BUSINESS. Returns nearly £400. Good house, at low rental. Price about £400.
4. EASTERN COUNTIES.—Vendor retiring. Mixed BUSINESS. Returns over £3000. Held by same family over 50 years. A good introduction will be given. Valuation; no premium for goodwill. To a gentleman prepared to invest about £600 cash, a good opportunity offers.
5. Watering-place, NORTH.—Good class Retail and DISPENSING. Returns over £800, at good prices. Low rental. Price about £600.
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VALUATIONS.

Terms for valuation on application.

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ADDRESS WANTED

OF Mrs. ACLAND, who was for some months in the winter at Eastbourne. Any information would be gladly received by B. K. EARNSHAW, Chemist, Eastbourne.

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Universally acknowledged by Pharmacists who have them in use to be the most Simple, Efficient, and Economical of all methods for preparing Syrups.

LIQUOR Ferri Iodidi.

EACH fluid drachm contains 34.4 grains of Iodide of Iron.

ONE volume added to seven volumes of *Syrupus, B.P.*, forms Syr. Ferri Iodidi of full Pharmacopœia strength.

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EACH fluid drachm contains 4 grains of Phosphate of Iron, 4 grains of Phosphate of Quinia, and $\frac{1}{8}$ grain of Strychnia.

ONE volume added to three volumes of *Syrupus, B.P.*, forms Easton's Syrup.

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EACH fluid drachm contains 8 grains of anhydrous Calcium Phosphate combined with Lactic Acid.

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LIQUOR Ferri Phosph.

EACH fluid drachm contains 8 grains of Ferrous Phosphate.

ONE volume added to seven volumes of *Syrupus, B.P.*, forms Syr. Ferri Phosph.

LIQUOR Ferri Phosph. Comp.

EACH fluid drachm contains, in addition to the alkaline Phosphates, 4 grains of Phosphate of Iron, and 8 grains of Phosphate of Calcium, dissolved in pure Phosphoric Acid.

ONE volume added to three volumes of *Syrupus, B.P.*, forms "Chemical Food."

LIQUOR Ferri Hypophosph.

EACH fluid drachm contains 8 grains of Hypophosphite of Iron.

ONE volume added to seven volumes of *Syrupus, B.P.*, forms Syr. Ferri Hypophosph.

On receipt of a Post Card, trial samples will be sent, carriage paid, to any address.

Detailed List, containing prices and particulars of upwards of thirty different combinations, post free on application.

FLETCHER, FLETCHER & STEVENSON, Holloway, London, N.

London: Printed by WILLIAM INGLIS RICHARDSON, 4 and 5, Great Queen Street, Lincoln's Inn Fields, and Published by Messrs. J. and A. CHURCHILL, 11, New Burlington Street.

The Pharmaceutical Journal AND Transactions.

THIRD SERIES, No. 677.] SATURDAY, JUNE 16, 1883. [PRICE FOURPENCE.

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Pharmaceutical Society of Great Britain,

17, BLOOMSBURY SQUARE, LONDON.

ELIAS BREMRIDGE, Secretary and Registrar.

NOTICES.

INDEX TO THE PHARMACEUTICAL JOURNAL FROM JULY, 1868, TO JUNE, 1878.

An Index of the ten Volumes of the *Pharmaceutical Journal*, from July, 1868, to June, 1878, has been compiled and printed, price 2*s.* 6*d.*, or by post, 2*s.* 8½*d.* Each Member and Associate of the Society will be supplied with one copy *gratis*, on application to the Secretary.

PRELIMINARY EXAMINATION.*

This Examination will be held throughout Great Britain, at 12 o'clock at noon, on the first Tuesdays in January, April, July, and October. Candidates must give notice to the Registrar on a printed form of application, to be obtained from him, and pay the Fee, not less than *fourteen* days prior to that on which the examination is to be held.

Each Candidate must state at which of the following centres he desires to present himself:—

Aberdeen	Cheltenham	Inverness	Norwich
Birmingham	Darlington	Jersey	Nottingham
Brighton	Douglas, Isle of Man	Lancaster	Oxford
Bristol	Dundee	Leeds	Peterborough
Cambridge	Edinburgh	Lincoln	Sheffield
Canterbury	Exeter	Liverpool	Shrewsbury
Cardiff	Glasgow	London	Southampton
Carlisle	Guernsey	Manchester	Truro
Carmarthen	Hull	Newcastle	Worcester
Carnarvon		Northampton	York

* A Certificate of having passed any of the Examinations approved by the Council (a list of which may be obtained from the Registrar) will be accepted in lieu of this Examination, provided Latin, Arithmetic, and English were included in the subjects of the Examination for which the Certificate was granted.

The Certificate must be forwarded to the Registrar, with the fee of Two Guineas, for the approval of the Board of Examiners, and must be so approved before the Candidate is eligible to enter his name for the Minor Examination

BENEVOLENT FUND.

For the Relief of Distressed Members or Associates of the Society of Pharmaceutical Chemists, and Chemists and Druggists, and their Widows and Orphans.

There are at present *thirty-eight* annuitants, receiving £1260 per annum, and casual relief is also granted, involving a total annual expenditure of about £1800.

The following is the scale of pensions:—

£30 per annum to pensioners under 65 years of age, and

£35 per annum to pensioners 65 years of age and upwards.

Donations or Subscriptions are earnestly solicited.

Cheques and post office orders to be made payable to ELIAS BREMRIDGE.

MAJOR, MINOR AND MODIFIED EXAMINATIONS.

The Board of Examiners for England and Wales meets at 17, Bloomsbury Square, London, in February, April, June, July, October, and December, and the Board of Examiners for Scotland meets at 119A, George Street, Edinburgh, in January, April, July, and October, for the purpose of conducting the above Examinations. Candidates must give notice to the Registrar in London, and pay the fee on or before the *first* day of the month in which the Examinations are held. Each candidate for the Major and Minor Examinations must, at the time of giving notice, produce a Registrar's Certificate of Birth, and a certified declaration that for three years he has been registered and employed as an Apprentice or Student, or has otherwise for three years been practically engaged in the translating and dispensing of prescriptions. Printed forms of declaration may be obtained from the Registrar in London. Each Candidate for the Modified Examination must state the number of the receipt for his declaration and his age at the time of giving notice.

Candidates will receive notice of the date on which they will be required to present themselves.

In the practical portion of the Major Examination standard works of reference are provided for the use of Candidates at the discretion of the Examiner. No other books or memoranda are allowed.

SPECIAL NOTE.

Each Candidate must state, at the time of giving notice, whether he desires to be examined in London or in Edinburgh.

THE SCHOOL OF PHARMACY

OF THE

Pharmaceutical Society of Great Britain.

FORTY-FIRST SESSION, 1882-83.

CHEMISTRY AND PHARMACY. .....Professor REDWOOD.

On Monday, Tuesday, and Wednesday Mornings, at 9 o'clock.

BOTANY AND MATERIA MEDICA .....Professor BENTLEY.

On Thursday, Friday, and Saturday Mornings, at 9 o'clock.

PRACTICAL CHEMISTRY .....Professor ATTFIELD.

Daily at 10 o'clock, in the Laboratory.

SYSTEMATIC AND PRACTICAL BOTANY.

The Summer Course on Systematic and Practical Botany commenced on Saturday, May 5th, at 8 o'clock, in the Gardens of the Royal Botanic Society, Regent's Park, and will be continued on the succeeding Friday and Saturday Mornings, at the same hour, until the end of July.

THE LECTURES ON CHEMISTRY AND PHARMACY

Comprise the following subjects:—

1. An exposition of the physical forces involved in chemical and pharmaceutical operations and changes.

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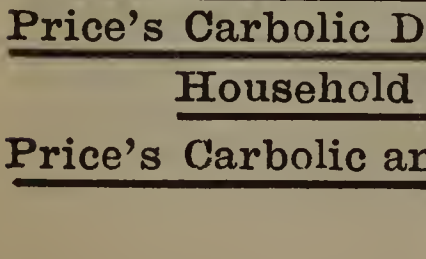

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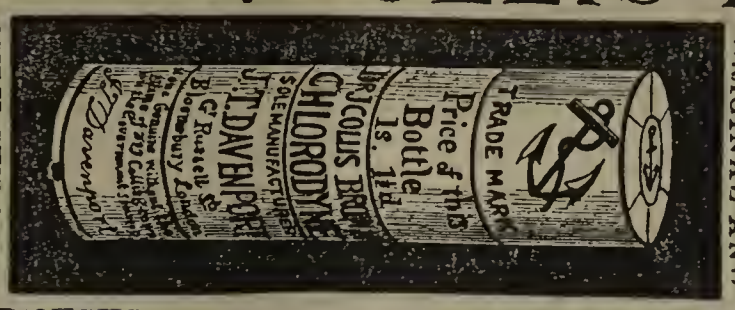

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IMPORTANT DECISIONS.

Lord Chancellor SELBORNE, Vice-Chancellor Sir W. PAGE WOOD, and the LORDS JUSTICES of APPEAL.

VICE-CHANCELLOR SIR W. PAGE WOOD, by whom the suit in Chancery was first heard, stated, in his judgment, that "Dr. J. Collis Browne was undoubtedly the Inventor of Chlorodyne, that the whole story of the Defendant Freeman was as deliberately untrue as the falsehood he had deposed to with reference to the use of his Chlorodyne in the Hospital."

THE VICE-CHANCELLOR also stated, "that Chlorodyne was a fanciful name, and had application been made sooner, the Court would have given Dr. Browne protection."

LORD CHANCELLOR SELBORNE coincided with the judgment of the Vice-Chancellor upon this point, and stated "that had application been made at a proper time and place, the Court would have found means to restrain the Defendant from misrepresenting the decision of the Vice-Chancellor."

LORD JUSTICE JAMES on appeal stated, in his judgment, "that the Defendant Freeman had made a deliberate misrepresentation of the decision of Vice-Chancellor Wood."

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To the Editor of THE WESTERN MORNING NEWS, *Sept. 4th*, 1882.

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THE NEW PHARMACOPŒIAS FOR THE UNITED STATES AND GERMANY.

(*Continued from page* 838.)

Oleum Morrhuæ, U.S.P.; Oleum Jecoris Aselli, P.G.—The U.S.P. permits the use of oil derived from other species of *Gadus* besides *G. Morrhua*, L., but without specifying their names. The P.G., on the other hand, gives only *G. Morrhua* as the source of the oil, omitting the other species named in the last edition. The P.G. does not give the sp. gr., but in the U.S.P. it is given as 0·920 to 0·925. With nitric acid the oil should give a purple colour changing to brown. It is said that seal oil has lately been largely used to adulterate cod liver oil, and a test for detecting the presence of it would be desirable in any future Pharmacopœia.

Oleum Myrciæ, U.S.P.—This oil, which forms the chief ingredient in bay rum, is obtained from the leaves of *Myrcia acris*, and is described as a brownish or dark brown liquid, with an aromatic, somewhat clove-like odour and a slightly acid reaction; sp. gr. 1·040. It should be soluble in half its weight of alcohol and form a semi-solid mass with a concentrated solution of potash.

Oleum Myristicæ, U.S.P.; Oleum Macidis, P.G.—The U.S.P. directs that it be obtained from nutmeg and the P.G. from mace, the fatty oil known in this country as oil of mace being the "oleum nucistæ" of the P.G. It should be remembered, therefore, by English pharmacists, that "oleum macidis," when occurring in a German prescription, refers to the volatile oil.

Oleum Nucistæ, P.G.—The P.G. gives as a test of its purity that caustic ammonia should not give a reddish, or, if any, only a slight brownish colour to the pale yellowish tincture made by heating the oil with ten times its weight of spirit and subsequently cooling it. This appears to be intended to detect turmeric, with which an artificial product might be coloured.

Oleum Olivæ, U.S.P.; Oleum Olivarum, P.G.—Both Pharmacopœias give the same sp. gr., 0·915 to 0·918. The elaidin test by which cotton seed and other oils giving a coloured mass with nitric acid may be detected is given. Under *Oleum olivarum commune*, the P.G. gives a test which is apparently intended to detect the presence of crude rape oil. This consists in strongly shaking 5 grams of the oil with 2 drops of sulphuric acid, when the mixture should have a greenish colour, which when the vessel is immersed in boiling water should not turn to black.

Oleum Rapæ, P.G.—Refined rape oil is apparently intended, since unrefined oil would become bluish-black when the sulphuric acid test is applied.

Oleum Picis Liquidæ, U.S.P.—The sp. gr. should be about 0·970, and the oil should be readily soluble in alcohol and have an acid reaction.

Oleum Ricini, U.S.P. and P.G.—The sp. gr. should be 0·950 to 0·970. The U.S.P. states that it should be soluble in an equal weight of alcohol. According to the P.G., it should be soluble in 1 to 3 parts of spirit. Three grams of castor oil mixed with 3 of bisulphide of carbon, and shaken with 2 grams of castor oil for a short time, should not give a blackish brown colour.

Oleum Rosæ, U.S.P. and P.G.—The P.G. does not refer the oil to any particular species; the U.S.P. refers it to *Rosa damascena*, Mill. The U.S.P. gives the sp. gr. as about 0·860, and the other tests given are chiefly those of Baur ('Pharmacographia,' 1st edit., p. 238). The P.G. directs that, when 1 part is diluted with 5 parts of chloroform and 20 parts of spirit added, the spirituous solution should not redden moistened litmus paper, indicating the absence of solid fatty acids soluble in alcohol.

Oleum Santali, U.S.P.—The sp. gr. is given as about 0·945. The oil is to be derived from *Santalum album*. Although this species yields an oil which has been used in native Indian practice for gonorrhœa, the oil which was recommended by Dr. T. B. Henderson, who appears to have been the first to introduced it into medical practice, was derived from *S. myrtifolium* (*Med. Times and Gaz.*, June, 1865, p. 571).

Oleum Sinapis volatile, U.S.P.; Oleum Sinapis, P.G.—As there is a fixed oil of mustard which is occasionally used in embrocations, the designation used in the P.G. is unfortunate. The U.S.P. requires that on heating the oil to 50° C. (122° F.), in a flask connected with a well-cooled condenser, no liquid having the odour and characteristics of disulphide of carbon should pass over.

Ononidis Radix, P.G.—The time for collection of the root (*O. spinosa*) is now omitted.

Phellandrii Fructus, P.G.—The dimensions of the seeds are now added, and the warning against the use of the sub-globular or ovate fruits of *Cicuta virosa* and *Sium latifolium* is omitted.

Pimpinellæ Radix, P.G.—The roots of *P. magna* and *P. Saxifraga* are still official, but the caution against the use of the root of *Peucedanum Oreoselinium*, Moench, and *Heracleum Sphondylium*, L., is now omitted.

Prinos, U.S.P.—Black alder bark, *Prinos verticillatus*, L., is retained from the secondary list, probably in deference to the esteem in which it is held as a domestic remedy for cutaneous diseases and sluggish ulcers. In spite of its name it bears no relation to the alders, although it grows in similar situations, but is nearly allied to the holly.

Prunus virginiana, U.S.P.—*Prunus serotina*, Ehrh., is now given (*Cerasus serotina*, Lois.), instead of *Cerasus serotina*, Dec., as the name of the tree from which the bark is derived. The bark is to be collected in autumn, at which time it contains more prussic acid (*Amer. Journ. Pharm.*, xxiv., iii.), and gives a darker infusion (*ibid.*, July, 1872, p. 304). The bark of the small branches is to be rejected. The bark from the old wood deprived of its corky layer is admissible. The bark is apt to deteriorate on keeping and is best preserved in a tin box or closed vessel.

Pulsatilla, U.S.P.—Under this name the herb of *Anemone Pulsatilla*, L., *A. pratensis*, L., and *A. patens*, L., var. *Nuttalliana*, Gray, are official. The plants should be collected soon after flowering, carefully preserved, and not be kept longer than one year. This remedy appears to have been borrowed from the homœopaths, although the first-named plant is not official in the Homœopathic Pharmacopœia. The attention which has recently been directed to *A. pratensis* and *A. Pulsatilla*, L. (*Practitioner*, July, 1882, p. 32) may perhaps have led to the adoption of the last-named species.

Pyrethrum, U.S.P.—The root of *Anacyclus Pyrethrum*, D.C., is now adopted from the secondary list and a tincture of pellitory introduced. The German pellitory root, *Anacyclus officinarum*, Hayne, is omitted from the new German Pharmacopœia.

Quillaia, U.S.P.—Probably introduced on account of its use in certain skin diseases and as an emulsifying agent for oils and oleoresins, etc. (*Pharm. Journ.*, [3], vol. x., pp. 187, 236).

Resina, U.S.P.; Colophonium, P.G.—The U.S.P. gives the melting point as 135° C. (275° F.), and the sp. gr. as 1·070 to 1·080. According to the P.G. the sp. gr. is 1·068 to 1·070. American colophony is specially ndicated in the P.G., although that from other sources is admissible.

Resina Copaibæ, U.S.P.—This should be soluble in alcohol, benzol, or amylic alcohol. Its recommendation by Dr. S. Wilks (*Lancet*, June, 1873), as having certain therapeutic advantages over the oleoresin, may have had some influence in obtaining it a place in the new Pharmacopœia.

Resina Dammar, P.G.—This is new to the German Pharmacopœia, and is given as the produce of *Dammara alba* (*Agathis alba*), *Dammara orientalis*, *Hopea micrantha*, *Hopea splendida*, and other trees of southern India. The powder should not soften at 100° C., but should be easily soluble in ether, chloroform and bisulphide of carbon and less so in spirit and petroleum benzin.

Resina Jalapæ, U.S.P. and P.G.—The additional tests now given in the U.S.P. are that it is insoluble in bisulphide of carbon, but that one part is soluble in 50 parts of warmed water of ammonia and that the solution when cooled does not gelatinize and remains clear after being supersaturated with acids. The ammoniacal solution quickly evaporated should leave a residue soluble in water. Similar tests are given in the P.G., except that it is there stated that the resin is soluble in 5 parts of warm solution of caustic ammonia.

Resina Podophylli, U.S.P.; Podophyllinum, P.G.—Although podophyllin is now official in the P.G., the rhizome from which it is derived is not so. The U.S.P. now allows the powdered root to be macerated before percolation for forty-eight hours only instead of four days. The quantity of hydrochloric acid to be used in precipitating the resin has been lessened and the resin is directed to be dried by exposure to the air in a cool place. It gives no description of the resin of podophyllin, but states that it is partly soluble in ether, and the residue when dissolved in solution of potash is precipitated by the addition of dilute hydrochloric acid in excess. No use appears to have been made of Messrs. Power's* or Podwissotzki's† researches on the constitution of podophyllin to improve the process for its manufacture, although they have shown that the portion insoluble in ether has no action on the system and that the pains in the intestine produced by podophyllin are due to podophyllo-quercetin and that podophyllotoxin is the active principle. The P.G. describes podophyllin as a yellow powder or loose friable mass of a yellowish or brownish-grey colour, this latitude as regards appearance being perhaps dependent on the researches of Senier and Lowe and others which showed that the colour is in great measure dependent on the fineness of division of the powder and does not affect the physiological activity of the preparation (*Pharm. Journ.*, [3], viii., 444). According to the P.G., at a temperature of 100° C., podophyllin gradually assumes a darker colour, but does not melt; when shaken with water and filtered it gives a liquid almost free from colour, of a bitter taste, turning brown on the addition of sesquichloride of iron. When solution of subacetate of lead is added to it it assumes a yellow colour and slight opalescence, reddish-yellow flocks subsiding after a time. The yellowish brown solution made by dissolving podophyllin in 100 parts of caustic solution of ammonia does not become turbid when diluted with water, but if neutralized deposits brown flakes. The intensely brown solution made by dissolving podophyllin in 10 parts of spirit throws down greyish-brown flakes on the addition of water. Podophyllin should be only partly soluble in ether and still less so in bisulphide of carbon.

Resina Scammoniæ, U.S.P.—This is omitted from the P.G., which does not now contain the drug in any form. The U.S.P. remarks that it is entirely soluble in ether and dissolves in solution of potash, and the heated solution is not precipitated by the addition of hydrochloric acid.

Rhamni Catharticæ Fructus, P.G.—The distinction between the fruits of *R. Frangula* and *R. cathartica* is now omitted.

Rheum, U.S.P.; Radix Rhei, P.G.—In both the U.S.P. and the P.G. rhubarb is now stated to be the produce of *Rheum officinale*, Baillon, and other undetermined species, by which and by the accurate description of Chinese rhubarb it may be supposed that the cultivated rhubarbs of commerce are intended to be excluded, although the wording apart from the description would leave the dispenser at liberty to use any rhubarb of unknown source. The "white, elongated meshes," characteristic of Chinese rhubarb, may be sought for in vain in the *Rheum officinale*, as cultivated in this country. The directions forbidding the use of Austrian or English rhubarb are now omitted from the P.G., being apparently deemed superfluous when Chinese rhubarb is directed to be used.

Rhus glabra, U.S.P.—The gender of the specific name is now changed from the neuter to the feminine, and a short description of the fruit, which is the part of the plant used, is now given. The drug was in the secondary list in the last edition.

Rhus Toxicodendron, U.S.P.—This has been retained from the secondary list of the last edition, where it appeared as *Toxicodendron*. From the P.G. it is now omitted. *R. radicans*, L., which differs in having entire and glabrous leaflets, is also official. The leaves of these species should not be confounded with those of *Ptelea trifoliata*, which have sessile leaflets. The drug is apt to lose its properties when kept.

Rosa centifolia, U.S.P.; Flores Rosæ, P.G.—The U.S.P. remarks that when it is desired to keep fresh "pale rose" for some time, it may be preserved by mixing it well with half its weight of chloride of sodium, pressing the mixture into a suitable jar, and keeping it well closed in a cool place.

Rosa gallica, U.S.P.—Not official in the P.G. In the U.S.P. the petals are now directed to be collected before expanding.

Rubus, U.S.P.—The bark of the root of *Rubus trivialis*, Mich., as well as of *R. villosus*, L., and *R. canadensis*, is now official.

Rubus idæus, U.S.P.—The fruit of this species is one of the additions to the United States Pharmacopœia. The closely allied light red fruit of *R. strigosus*, Mich., and the purplish black fruit of *R. occidentalis*, L., may be employed in place of the

* 'Proc. Amer. Phar. Assoc.,' 1877, p. 420; *Amer. Jour. Phar.*, 1878, p. 369.

† *Ph. Journ.*, [3], xii., pp. 217, 1012.

above. The official preparation is a syrup, but it would be scarcely politic to use the purplish syrup of *R. occidentalis* in a mixture in which the red syrup of the other species had previously been dispensed. In any case it would be advisable for the prescriber, in order to prevent doubts arising, to indicate which syrup he intends to be used.

RUMEX, U.S.P.—This is retained from the secondary list of the last Pharmacopœia. A description is given, which, it may be supposed, refers only to the root of *R. crispus*, but other species are also now official.

SABINA, U.S.P.—A description is now given, but the time for collection of the tops is not indicated.

SALIX, U.S.P.—Other species besides *Salix alba*, L., are now official, but a description is given which may be presumed to apply to the bark of *S. alba* only.

SALVIA, U.S.P.; FOLIA SALVIÆ, P.G.—The time of collection (before the plant opens its flowers) is now omitted from the P.G.

SAMBUCUS, U.S.P.; FLORES SAMBUCI, P.G.—The flowers of *S. canadensis*, L., are official in the U.S.P., but in the P.G. those of *S. nigra*. The latter should not be of a brown colour.

SANGUINARIA, U.S.P.—A fluid extract prepared from the rhizome of *S. canadensis*, L., is now added to the official preparations, and a description of the crude drug is given.

SANTALUM RUBRUM, U.S.P.—The drug should not impart any red colour to water when macerated in it. It is to be regretted that the erroneous name of *Santalum* should be perpetuated, more especially as the drug itself is hardly ever ordered in prescriptions, and that there is therefore less reason for the retention of the name.

SANTONICA, U.S.P.—The botanical source is now stated to be *Artemisia maritima*, var. *Stechmanniana*, Besser, and a description of the drug is given.

SARSAPARILLA, U.S.P.; RADIX SARSAPARILLÆ, P.G.—The root of *S. medica*, Schlecht, is now official in the U.S.P. as well as that of *S. officinalis*, Kth., and other species. In the P.G. Honduras sarsaparilla is official, but no botanical source is given. Both Pharmacopœias direct that the rhizome should be rejected.

SASSAFRAS, U.S.P.—A description of the official parts, which are the root-bark and pith, is given. The mucilage obtainable from the pith should not be precipitated by alcohol.

SCAMMONIUM, U.S.P.—Ether should dissolve at least 75 per cent. of the drug. Scammony is stated to yield a greenish emulsion when triturated with water.

SCILLA, U.S.P.; BULBUS SCILLÆ, P.G.—*Urginea Scilla*, Steinheil, is now given in the U.S.P., and *Urginea maritima* in the P.G. as the botanical source of the drug.

SCOPARIUS, U.S.P.—Koch is now given as the authority for the botanical name, *Sarothamnus scoparius*, instead of Wimmer, and a description of the twigs is given.

SCUTELLARIA, U.S.P.—A description of the plant, *S. lateriflora*, L., is now given. The drug, which was official in the secondary list of the previous Pharmacopœia, appears to have increased in estimation, since a fluid extract of it is now official. It is highly appreciated as a nervine tonic in domestic medicine in the United States, and by herbalists in this country.

(To be continued.)

RECENT PROGRESS IN THE OZOKERITE INDUSTRY IN THE EAST.*

BY E. SAUERLANDT.

Ozokerite or mineral wax frequently accompanies petroleum, and traces of it are found in many places in Eastern and Western Galicia, and in the Caucasian and American petroleum territory, but it is rarely found in such quantities as to furnish a remunerative source of this valuable mineral. It is highly probable that many more workable deposits of ozokerite will be discovered yet, but hitherto the discovery of deposits that yield paying quantities have been so rare that we are greatly pleased to be able to announce that the past year did not pass without some success in this direction.

At the baths of Truskawiec, some five miles from Boryslaw, a deposit of this substance was found at a slight depth, of such extent that 50 tons have already been taken out and sold. The wax contains sulphur, and hence the oils produced in making paraffine from it must be used with some special precautions. This discovery of ozokerite in Truskawiec is the more interesting because Leo Strippelmann several years ago, in his well-known work on the petroleum industry of Galicia, had referred to this place as particularly worthy of examination for the occurrence of ozokerite.

The same mineral is also reported as occurring in the neighbourhood of Agram in Croatia, and investigations made there have proved the existence of deposits of considerable extent and tolerable thickness. Whether the hopes based thereon will be actually realized, the future must decide. At all events, this notice and the announcements of recent discoveries of ozokerite in Russia, must be received with caution, for such announcements have frequently been made and no important results followed.

Other places in Eastern Galicia which may be looked upon as sources of ozokerite, besides Truskawiec, are Boryslaw, Dwiniacz, and Starunia, with Boryslaw at the head as hitherto. In all three of these places the wax is found in Miocene clay shales and clay marls with the intermediate sandstone, and frequently it accompanies rock salt and gypsum. While shafts have been sunk in Boryslaw to the depth of 200 metres (nearly 700 feet), they have not penetrated deeper than 30 or 40 metres (100 or 130 feet) in Starunia and Dwiniacz.

In Boryslaw the majority of the shafts are at present in the possession of three large companies, the oldest of which, "The French Mineral Wax and Petroleum Society," has been in existence for years, while the "Lemberger Credit Bank" and the firm of Gortenberg, Liebermann and Co. have commenced operations within the past year by the purchase of numerous shafts. In the first half of last year the first-named society could point to a large production, but they have almost completely exhausted their present horizon and are now going deeper, but with a smaller yield. The two other societies had, and still have, to contend with the drainage of their long-neglected shafts, and hence their production is not as large as could be desired.

In Boryslaw-Wolanka the production of mineral wax in the year 1882 was less than in the preceding year, but in view of the difficulties to be overcome, it must be considered relatively speaking as favourable, and cannot be much less than that of 1877, which was 8300 tons.

The price fluctuated from January, 1882, when it was 27¼ Austrian florins (about £2 15*s.*) per 100 kilos, to 25 florins in May, then steadily rose until the highest point (31½ florins) was reached in November, and there it remains. It is very questionable if the manufacturers can use it profitably at this price, and several establishments have already imported American paraffine to take its place, and with good results. As it may be expected

* From the *Chemiker Zeitung*. Reprinted from the *Scientific American*, May 19, 1883.

that the production of ozokerite will increase in the immediate future, we may predict a fall in the price.

Dwiniacz and Starunia yield about 25 tons per month, which at present prices pays well.

Before passing to the method of working it up, we must first consider how it is obtained, as one of the methods yields a product already partially purified. We refer to the extraction of the wax from the gangue called "lep." By melting it under water the greater part of the ozokerite is removed, but the residue still contains as much as 12 per cent. of wax. These residues collect in enormous quantities, and hitherto were only considered as a nuisance, although the wax still in them represented an enormous capital. It is surprising that this capital was allowed to lie idle so long. It cannot be due to the small quantity of wax in it, because at the Brown coal works in Halle it pays to work coal which only yields 10 per cent. of tar, or 12 to 15 per cent. of tarry resins. The cause may be sought chiefly in the difficulty of working the residues, since the high price of fuel prevents them being liquated or distilled on the spot, and there is no suitable apparatus for extracting so dense a substance as clay and shale. According to the *Neue Freie Presse*, an ozokerite mechanic made an apparatus in 1879 that would make 6600 to 7700 pounds of pure wax from ten times that quantity of ore daily, yet this apparatus of the unnamed workman has never been in operation.

In the past year J. Merz, in Boryslaw-Wolanka, first succeeded in working these residues in his extraction apparatus, which has been patented in most countries. If the extractors now in use have not been constructed on so large a scale and capable of so large a daily yield as the one made in 1879, they have the undeniable advantage that they work, not merely on paper, but in reality.

About one-third of the ozokerite that comes into the market is worked into paraffine, and two-thirds into ceresine. The use of mineral wax for making paraffine has increased, especially in Galicia, and here, too, distillation in superheated steam is commonly employed. A large portion of the paraffine made is consumed there for making the Sabbath candles used in their religious rites by the Jewish inhabitants. It is not so carefully purified for this purpose as is done elsewhere.

The Galician factories for the most part refine the largest possible quantity (50 to 70 per cent.) of the waxy distillate directly with fuming sulphuric acid and without pressing it. Of course the resulting paraffine is not free from oil, but it is tolerably white in colour and useful for the purpose mentioned.

Very little has been made public concerning improvements in making paraffine from ozokerite, and manufacturers keep their experience as secret as posible.

In 1881 E. Van Haecht and J. Schreier obtained a patent for purifying paraffine by blowing out the contaminating oils with superheated steam. It can be used for paraffines containing as an impurity light oils, as is the case, in careful distillation, with the first portion of the wax distillate and so long as the paraffine already present in the wax goes over undecomposed. The crude paraffines resulting from the decomposition of resinous bodies, as for example in the dry distillation of brown coal, or of the resin obtained by distilling ozokerite, cannot be purified by this method, as they contain oils specifically heavier than and often having as high a boiling point as the paraffine itself.

In 1881, H. Ujhely took a patent for refining and hardening paraffine. According to the English specification, the crude paraffine was melted with a mixture of petroleum benzine, and alcohol (methylic, ethylic, or amylic), and after cooling slowly it was expressed. The advantages gained in this way over the common use of benzine (photogen) alone, in our opinion, consists merely in obtaining an oil more free from paraffine, since paraffine is considerably less soluble in alcohol than in benzine. Whether this is sufficient to counterbalance the disadvantages of working with alcohol, we will not attempt to say. We know, however, that in 1873 a paraffine factory added fusel oil to the paraffine for pressing, but after a few months returned to the use of benzine.

The yield of paraffine is essentially increased when superheated steam is employed in the distillation of the ozokerite, and in working a wax suitable for making paraffine it amounts to 60 or 70 per cent. Hence we can no longer adhere to the data hitherto published, which place the limits at 36 to 50 per cent.

In making ceresine the chief improvements consist in a profitable utilization of the residues. Two methods are chiefly employed in the factories themselves. The first and simpler consists in heating the ozokerite with fuming and common oil of vitriol to 200° C. (392° Fahr). until the greater part of the acid is removed either by decomposition or evaporation, and then treating it at a suitable temperature with neutralizing and decolorizing agents such as alumina, silicates, bone coal, the refuse of prussiate factories, etc. By the second method the resinous and discolouring constituents of the wax are also removed with acid, but at a relatively low temperature, thus avoiding so thorough a decomposition.

To bleach ozokerite perfectly on a large scale without the use of acids has as yet remained an unfulfilled desire, although in 1879 a method for accomplishing it was announced as a new discovery of H. Ujhely in Vienna. Without going into a discussion of priority, we must remark that George Gwynne in his English patent of 1871 for "treating fatty and hydrocarbon bodies," etc., describes a process for bleaching ozokerite which possesses a striking resemblance to that of Ujhely. Gwynne removes the mechanical impurities and then dissolves it in benzine, filters through bone black, and removes the solvent by blowing in air. This method is identical in principle with Ujhely's. Gwynne did not obtain any practical results, nor has Ujhely, nor Ofenheim, who took a patent on the same thing in 1879. The statement made then, that a factory was being built with a large apparatus on Ujhely's system, was based on facts; but it must be added that the building stopped before it was finished, and that the unfinished building has been in that state for two years, while the large apparatus remains in the workshop awaiting payment by the man who ordered it.

Even if the difficulties that beset the working of Ujhely's patent on a large scale were overcome, and the consumption of decolouring agents reduced to a minimum, the product obtained would find only a very limited field of sale. Ujhely's "bleached mineral wax" would not be in much demand as an independent illuminant, owing to the large quantity of oxygenated resin in it, most of which is removed by the present method of treating it with sulphuric acid.

Finally, we may be permitted one short remark about a circumstance which has hitherto received too little attention.

Ceresine and paraffine are largely employed, as everyone knows, for adulterating beeswax, and the methods in use for the detection of such adulterations are frequently based upon a determination of the specific gravity of the specimen in question. A short time ago a table was published (*Chemiker Zeitung*, vi., page 74), giving the specific gravity of different kinds of wax and their mixtures, but in our opinion it is of very little use because it sets out with false premises in assigning a definite specific gravity to paraffine and ceresine. The specific gravity varies from 0·869 for that which melts at 100° Fahr. to 0·943 for that melting at 180° Fahr., as was shown by the author as early as 1878.

The following table shows the melting points of ozokerite paraffine:—

Solidifying points.		Spec. gravity.
56° C.	133° F.	0·912
61° „	142° „	0·922
67° „	153° „	0·927
72° „	162° „	0·935
76° „	169° „	0·939
82° „	180° „	0·943

Since the specific gravity of paraffines that solidify at different temperatures is different, ozokerite and the ceresine made from it must differ in specific gravity. Then we must consider that commercial ceresine frequently receives an addition of paraffine, resin, carnauba wax, etc., by the manufacturers themselves.

ALGIN: A NEW SUBSTANCE OBTAINED FROM SOME OF THE COMMONER SPECIES OF MARINE ALGÆ.*

BY E. C C. STANFORD, F.C S.

(*Concluded from page* 1022.)

The following samples are from a considerable bulk of mixed salts evaporated:—

Analyses of the Salts.

	Laminaria Stenophylla.	Fucus Vesiculosus.
Calcium sulphate	1·69	4·33
Potassium sulphate	11·29	23·62
Potassium chloride	19·90	13·71
Sodium chloride	60·96	58·20
Magnesium chloride	4·35	—
Sodium carbonate	·53	—
Sodium iodide	1·26	·12
	99·98	99·98

In the following tables the composition of the salts is shown as they come out in six successive macerations in cold water.

The residues are always carbonized, and then washed and again ignited—that being the only way to insure perfect combustion in the presence of such an excess of saline constituents.

Laminaria Stenophylla—Air dried, containing 14·8 *moisture.* 4 oz. = 1750 grains. Six macerations in cold water—all evaporated, and residues weighed:—

		Grs.	Per cent.	Grs.	Per cent.
1st water	weight of residue	288	16·45	499	= 28·5
2nd	,, ,,	211	12·05		
3rd	,, ,,	40	2·28	77·2	= 4·4
4th	,, ,,	37·2	2·12		
5th	,, ,,	21·1	1·20	39·7	= 2·26
6th	,, ,,	18·6	1·06		
		615·9 = 35·16 per cent.			

	1	2	3	4	5	6
Volatile matter	23·4	28·0	29·3	40·0	54·5	69·1
Salts	67·1	60·1	55·5	40·0	31·8	22·5
Fixed carbon	3·91	4·97	4·1	4·56	2·23	·96
Ash	5·59	6·93	11·1	15·44	11·4	7·44
	100·0	100·0	100·0	100·0	100·0	100·0

Composition of Salts.	1	2	3	4	5	6
Calcium sulphate	3·91	1·02	Nil.	Nil.	Nil.	Nil.
Potassium sulphate	7·53	10·08	19·48	20·80	Trace.	Trace.
Potassium chloride	34·05	30·95	24·81	23·78	,,	,,
Sodium chloride	45·55	53·00	53·57	51·04	,,	,,
Sodium iodide	1·95	1·58	2·00	1·25	,,	,,
Sodium carbonate	Nil.	Nil.	Tracc.	3·30	,,	,,
Magnesium chloride	8·55	3·40	Trace.	Trace.	,,	,,
	100·54	100·03	99·86	100·17	,,	,,

* Read before the Chemical Section of the Glasgow Philosophical Society, April 2, 1883. Communicated by the Author.

Laminaria Stenophylla—Air dried (calculated percentage on original weed):—

	Per cent.	Volatile.	Salts.	Carbon.	Ash.
1st water	16·45	3·85	11·04	0·64	0·92
2nd ,,	12·05	3·35	7·26	0·60	0·84
3rd ,,	2·28	0·68	1·26	0·09	0·25
4th ,,	2·12	0·86	·85	0·09	0·32
5th ,,	1·20	0·656	·38	0·027	0·137
6th ,,	1·06	0·732	·24	0·010	0·078
	35·16	10·128	21·03	1·457	2·545

Composition of Salts:—

	1	2	3	4	5	6	Total.
Calcium sulphate	0·321	0·074	Nil.	Nil.	Nil.	Nil.	0·395
Potassium sulphate	0·831	0·731	0·245	0·177	Trace	Trace	1·984
Potassium chloride	3·759	2·247	0·312	0·202	,,	,,	6·520
Sodium chloride	4·970	3·846	0·678	0·432	,,	,,	9·926
Sodium iodide	0·215	0·115	0·025	0·011	,,	,,	0·366
Sodium carbonate	Nil.	Nil.	Trace	0·023	,,	,,	0·028
Magnesium chloride	0·944	0·247	,,	Trace	,,	,,	1·191
	11·040	7·260	1·226	0·850	0·38	0·24	21·030

Laminaria Stenophylla—Air-dried (Residual weed—Weight 2 oz., or 50 per cent.):—

		Calculated on original weed per cent.
Volatile matter	74·2	37·1
Charcoal	25·8	12·9
	100·0	50·0
Charcoal:—		
Salts	18·0	2·32
Fixed carbon	50·7	6·55
Ash	31·3	4·03
	100·0	12·90
Salts:—		
Potassium sulphate	35·27	·818
Potassium chloride	6·72	·156
Pota-sium carbonate	5·00	·116
Sodium carbonate	49·97	1·169
Sodium iodide	2·63	·061
Alkaline earths	Nil.	Nil.
	99·49	2·320

Fucus Vesiculosus—Dried (containing 2·11 per cent. moisture:—

4 oz. = 1750 grs. Six macerations in cold water—all evaporated, and residues weighed.

		Grs.		Per cent.	
1st water	-weight of residue	174·5		= 9·45	11·90
2nd	,, ,,	43·0		= 2·45	
3rd	,, ,,	11·2	0·64	= 0·99	
4th	,, ,,	6·15	0·35		
5th	,, ,,	Trace.			
6th	,, ,,	Trace.			
		234·85		= 12·89	

	1	2	3	4
Volatile matter, etc. . .	37·78	68·4	47·48	62·86
Salts	49·03	27·62	29·22	25·71
Fixed carbon	8·09	1·17	3·78	·74
Ash	5·10	2·81	19·52	10·69
	100·00	100·00	100·00	100·00

Salts:—

	1	2	3	4
Potassium sulphate . .	27·25	48·19	Trace.	Trace.
Sodium sulphate. . .	4·03	·57	,,	,,
Sodium chloride . . .	61·50	37·62	,,	,,
Sodium iodide . . .	·026	·02	,,	,,
Sodium carbonate . .	7·42	13·36	,,	,,
	100·226	99·76	,,	,,

Fucus Vesiculosus—dried (calculated on original weed)*:—

	Per cent	Volatile.	Salts.	Carbon.	Ash.
1st water . .	9·45	3·58	4·63	0·76	0·48
2nd ,, . .	2·45	1·68	0·67	0·03	0·07
3rd ,, . .	0·64	0·304	0·187	0·024	0·125
4th ,, . .	0·35	0·221	0·089	0·003	0·037
5th trace . .	—	—	—	—	—
6th ,, . .	—	—	—	—	—
	12·890	5·785	5·576	0·817	0·712

Composition of Salts:—

	No. 1.	No. 2.	No. 3.	No. 4.	Total.
Potassium sulphate . . .	1·262	0·343	Trace	Trace	1·605
Sodium sulphate . . .	0·186	0·004	,,	,,	·190
Sodium chloride	2·8378	0·2337	,,	,,	3·0715
Sodium iodide .	0·0012	0·00013	,,	,,	·00133
Sodium carbonate . . .	0·343	0·0895	,,	,,	·4325
	4·630	0·6700	0·187	0·089	5·576

Residual Weed—Fucus Vesiculosus (Weight 3 ounces 175 grains = 85 per cent.):—

		Calculated on original weed.
Volatile matter	65·65	55·81
Charcoal	34·35	29·19
	100·00	85·00

* This specimen was abnormally low in salts.

		Calculated on original weed.
Charcoal:—		
Salts	18·63	5·24
Fixed carbon	58·53	17·53
Ash	22·84	6·42
	100·00	29·19
Salts:—		
Potassium sulphate . .	29·41	1·5420
Sodium sulphate . . .	47·58	2·5030
Calcium sulphate . . .	9·34	0·4760
Magnesium sulphate . .	11·76	0·6160
Magnesium chloride . .	1·30	0·0680
Sodium carbonate . . .	·45	0·0235
Sodium iodide	·22	0·0115
	100·06	5·2400

After the salts have been removed, the weed is bleached by a weak solution of chlorinated lime, about 2° Twad. The laminaria bleaches easily in a few hours, but the fuci require prolonged and repeated treatment. I would call attention to the extreme beauty of some of the algæ when thus bleached; even in the common *Fucus vesiculosus*, or black wrack, you can trace the spores in the cells and the lining of the air-vessels. The specimen of *Sargassum bacciferum* (gulf weed) is beautifully transparent. Other specimens shown are *Laminaria digitata*, stems and fronds, the former looking like sticks of ivory, *L. stenophylla*, *Fucus nodosus*, *F. serratus*, *Alaria esculenta*, *Halidrys siliquosa*, *Rhodomenia palmata*, *Rhodomela pinnastroides*, *Zostera marina*, *Enteromorpha compressa*, etc. When sufficiently white, the weed is soured by a very weak solution of sulphuric or hydrochloric acid, and well washed. If the acid be added with the bleach the action is quicker. It is then acted on in the cold by about a tenth of its weight of sodium carbonate for twenty-four hours, then heated, filtered, and evaporated. The residual cellulose is pressed into cakes for use as a paper material. It is already bleached, and has only to be put at once into the paper beater. There are plenty of fibrous materials in the market, but there is no real substitute for rags, as, I believe, this will to a great extent prove to be.

The whole of the plant is thus accounted for; in the laminaria, the average yield is as follows:—

On the air-dried plant—	
Extracted by water	30
Extracted by acid	5
Extracted by sodium carbonate = algin . .	35
Cellulose	10
Moisture	20
	100

This plant is the only one now employed in making kelp; the least exposure to rain washes out the salts, and renders it useless for this purpose. It does not, however, interfere with its use for extracting the algin, which is insoluble in water. For this purpose, if the salts are sacrificed, it is improved by exposure to rain and light. The wet weed, however, keeps perfectly well if access of air be prevented, for instance in a properly constructed "silo," and there is no reason that any of it should be lost.

Applications of Algin.

Algin has properties which should make it useful for several applications in the soluble form. As a stiffener of fabrics, although not so rigid as starch, it fills the cloth better, is tougher, more elastic, and more transparent. It mixes in all proportions with starch and dextrine, and imparts to the mixture these properties. Unbleached, it forms a cheap material for dressing winseys and such dark goods. Passed through an acid bath, the coating becomes glossy and insoluble, and thus a vegetable mordant is available for dyeing. Lime-water, and salts of calcium, barium, and several metallic salts, may be em-

ployed for a similar purpose; one of its peculiarities being the ease with which it is rendered insoluble.

I shall only just refer to its probable value as a food material on account of its nitrogenous character, as I have no edible specimens on the table which can be passed round for immediate consumption. As a cattle food there is a large opening for such a material. The agglutinating power of algin enables us to convert into solid blocks many substances which are with difficulty made to cohere. Silica, lime, magnesia, oxide of zinc, phosphate of lime, alumina, chalk, plumbago. charcoal, and many other such substances can be converted into solid hard blocks. All of these and many more are exhibited. Some of these compounds may be made by mixing the algin with a solution, where both form a joint precipitate with another solution — *e.g.*, sodium silicate, and calcium chloride. One application of this agglutinating character has already assumed importance. Charcoal has been long known as our best solid non-conductor of heat, and no doubt it would have been employed long ago as a covering for our steam-boilers, had any medium been known capable of agglutinating it. That is now attained by this substance. My "carbon cement,"* for this purpose, contains 97 per cent. of charcoal, 3 per cent. of algin being sufficient to make it cohere; and as that charcoal is made from seaweed, it is a remarkable fact that the whole covering is derived from that material. My friend Mr. Spiller, a high authority on the subject, has also found the solution of algin the best thing yet discovered for arresting incrustation in steam-boilers. We are not much troubled with this in Glasgow, but in the south, where the waters are hard, many such fluids are employed. Most of these are organic compounds combined with alkalies. One of the earliest and best was introduced some years ago by Mr. Spiller himself, and I am entirely indebted to him for suggesting the application of algin to this purpose. He speaks of it as highly efficient in precipitating the lime in such a fine state of division that it can easily be blown off from the cock. So that we now propose seaweed in one form or other as a most comfortable internal and external application to our steam-boilers. In fact several large steamers are already ploughing the ocean, assisted in their daily conflicts with heavy seas by weapons borrowed from these opponents.

The insoluble form of algin is very like horn, and as it can be pressed into moulds of any size it may be used instead of that article.

It also appears to be an excellent non-conductor of electricity, and in combination with certain other substances may assist in providing the cheap non-conducting material, which shall be impervious to moisture, now so much required for underground telegraph and telephone wires.

It is an efficient agent for emulsifying oils, and, being coagulated by alcohol, for fining wines and spirits.

These are some of the probable applications of algin, and, seeing that the substance is new, and the source abundant, I shall not be bold enough to predict what it may *not* be used for.

PHARMACEUTICAL PREPARATIONS OF CORN SILK.†

BY GEORGE W. KENNEDY, PH.G.

During the past year several physicians of Schuylkill county have been using different preparations of the stigmata of Zea Mays for catarrh of the bladder and similar diseases, with very good results. The preparations should be made from the fresh article, as the dried seems to be worthless, at least that is the experience of those who have had the subject under investigation; cases under treatment, which were not benefited by the powder or other preparations made from the dried article, yielded to a tincture prepared from the fresh or green stigmata. It would be advisable to gather the drug before it begins to change in colour, or select only that portion having a green or greenish-yellow colour. The writer manufactured a quantity of the tincture last September, which has all been prescribed and used by our physicians, and is now compelled to purchase the fluid extract to supply the demands. One of our medical practitioners, who is very particular, has great confidence in the curative properties of corn silk; his choice of all the preparations is the syrup which I have made and would recommend to be made from the fluid extract. This is an expeditious mode of making the syrup, and one which is entirely satisfactory, the syrup containing only a very small percentage of alcohol. The diseases for which corn silk is recommended are of such a nature — generally of an inflammatory character — that the patient should not use alcohol in any form, because it produces irritation, and irritants should be left out of the preparations as much as possible.

Should the drug prove to be as valuable a remedy as some medical men consider it to be, there is no doubt but its use would become general. Either the fluid extract or the syrup, or both, would be the best preparations to recommend for introduction, although the tincture gave fair satisfaction; yet I do not believe it to be the most suitable preparation.

It should be remembered that the fresh drug contains a large amount of moisture; it contains certainly not less than 50 per cent., and likely considerably more. I would suggest that not less than double the quantity of the drug be used; for example, if 100 parts of syrup or tincture was to represent 12 parts of the dried material, then 24 parts of the fresh or green corn silk should be used. I would recommend the following formulas:—

Tincture of Corn Silk.

Take of—

Corn silk, green, twenty-four parts . . .	24
Diluted alcohol, sufficient to make one hundred parts	100

Cut the silk into small pieces, either with a large pair of scissors or a tobacco cutter; after which, place in a mortar and beat into a pulp with a small quantity of the diluted alcohol. Prepare a cylindrical glass percolator, by closing the lower orifice with a cork; transfer the silk pulp to the percolator, and add sufficient of the menstruum to form a layer over the pulp; cover the percolator closely and allow to macerate for forty-eight hours; then loosen the cork enough to permit percolation to proceed at the rate of 40 drops per minute; add enough diluted alcohol and continue the percolation until 100 parts are obtained. The tincture possesses the characteristic odour of corn silk, is of a yellow-straw colour, and of a pleasant, sweetish taste. Dose for an adult, 1 or 2 fluid drachms (gm. 4 to 8).

Fluid Extract of Corn Silk.

Corn silk, green, two hundred grams . .	200
Glycerin, twenty grams	20
Diluted alcohol, a sufficient quantity to make one hundred cubic centimetres .	100

Cut the silk into small pieces. Mix the glycerin with 80 grams of diluted alcohol. Place the cut corn silk into a mortar, and beat into a pulp with a portion of the menstruum; after which, pack in a cylindrical glass percolator; add sufficient of the mixture to cover the pulpy mass, and when the liquid commences to drop

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* Carbon cement forms a very light, inodorous, and cheap material for covering steam-boilers. Over 20,000 square feet have already been applied to boilers and piping.

† From the *American Journal of Pharmacy*, May, 1883.

from the percolator close the lower orifice; cover the percolator tightly, and allow to macerate for forty-eight hours; then permit percolation to go on slowly, about 40 drops per minute; add the remainder of the glycerin mixture, and then diluted alcohol until the drug is exhausted, reserving the first 70 cubic centimetres of the percolate; evaporate the remainder to 30 cubic centimetres, and mix with the reserved portion, making in all 100 cubic centimetres. The odour and taste is similar to that of the tincture, but much stronger, and the colour is a shade or two darker. Dose for an adult, from ½ to 1 fluid drachm (gm. 2 to 4).

Syrup of Corn Silk.

Fluid extract of corn silk, twelve parts . .	12
Syrup, eighty-eight parts	88
To make one hundred parts . .	100

Dose from 1 to 2 fluid drachms (gm. 4 to 8).

CALCIUM IODIDE.*

BY R. ROTHER.

As there are always new medicinal agents coming into use which are not often found in the market until the demand becomes quite general, the pharmacist is occasionally called upon to exercise the primitive function of preparing compounds obtainable in no other way. For such and similar cases only, the Pharmacopœia gives processes, in connection with those that are pre-eminently pharmacopœial. These are, however, rapidly improved in most cases, so that the early official method is not always the best after a ten years' period of general progress.

Calcium iodide is one of those compounds occasionally called for, which is not generally kept nor very easily prepared in a proper form. When caustic lime is triturated with iodine, a peculiar black combination is obtained in which chemical union of some kind is exerted. Similar compounds are produced when dry iodides are mixed with iodine in a like manner. Some of these bodies are soluble in alcohol, and then yield crystals of definite superiodide even of the monad metals. Water decomposes them, however, with the liberation of iodine. On boiling the black calcium oxide and iodine compound with water, a colourless solution of calcium iodide and iodate is obtained, whilst the excess of lime remains as hydrate. There is no convenient way of separating these salts, neither is the reduction of the attendant iodate practicable. Hence this process does not answer for the preparation of calcium iodide.

Calcium iodide may be prepared by dissolving calcium hydrate, or better, carbonate in hydriodic acid. The difficulty in this case is the preparation of the acid by a practical and convenient method, which so far has not been found. The usual process for preparing calcium iodide consists in decomposing ferrous iodide or ferric iodide with calcium hydrate. In the first instance the iron is precipitated as ferrous hydrate, and in the second as ferric oxy-hydrate. Both precipitates are excessively bulky, and require much washing to secure all of the generated calcium iodide. A correspondingly large volume of water will then have to be evaporated.

The process which embodies the most advantage consists in decomposing ferric iodide with calcium carbonate. In this case the iron is precipitated as the compact non-gelatinous ferric hydrocarbonate, according to the following reaction :—

$$2(FeI_3) + 3(CaCO_3) + 2(OH_2) = 3(CaI_2) + Fe_2CO_3(OH)_4 + 2(CO_2).$$

A very concentrated solution of calcium iodide is thus obtained, which cannot be properly filtered through paper in an undiluted condition. Its destructive action upon the paper results in soluble coloured products, which interfere with the whiteness of the dried salt. The affinity of calcium iodide for water is so great that when a very concentrated solution of it is mixed with an equally strong solution of dipotassic carbonate, no double decomposition occurs, but the potassic carbonate separates as a gelatinous magma. No calcium carbonate results until more water is added, when the calcium is immediately thrown down as white carbonate.

The calcium iodide on evaporation of its solution is obtained as a white or colourless crystalline salt containing water. The solution must be concentrated until a dense pellicle forms over the surface. The fused mass is then poured on a smooth surface and well covered to prevent deliquescence. On cooling, the salt is readily detached in large fragments. These may then be broken into smaller pieces and preserved in well-stopped bottles. Large, shallow capsules or ordinary dinner plates with bright smooth surfaces are the most suitable vessels for cooling the fused salt. During this part of the operation it is essential that moist air be excluded to prevent deliquesence. For this reason the salt is best dried under a bell-glass over sulphuric acid.

In the preparation of calcium iodide the use of iron filings is not admissible, because of the large amount and the peculiar form of the carbon contained in them. In this instance, a yellow organic acid is generated, which yields colourless ferrous salts and orange ferric salts not precipitable by calcium carbonate, but decomposable by calcium hydrate. The resulting calcium salt of this acid is also orange tinted, but is destroyed on fusion of the iodide, the carbonaceous residue imparting to this a greyish, unsightly appearance. Re-solution of the fused mass and filtration of the solution now produces a colourless salt. Iron wire also contains some carbon, but in a different state of combination, so that none of the peculiar acid is produced. With its use the iron is wholly precipitated by calcium carbonate, even in the presence of excess of iodine, and a white salt is directly obtained on evaporation. The contact of organic matter must, however, be carefully prevented in the manipulation, and the filtration of a too concentrated solution through paper must be avoided.

From these considerations, the following formula is derived:—

Iron in fine wire	56 parts.
Iodine	381 „
Calcium carbonate	150 „
Water sufficient.	

Mix 56 parts or any moderate excess of iron wire with 1200 parts of water and 254 parts of iodine gradually added. When the reaction is completed and a light green solution is obtained, filter this and add to it the remainder of the iodine. Then, when this has all dissolved with the formation of a brown-red solution, add the calcium carbonate (150 to 160 parts) by degrees, and warm the mixture when the effervescence slackens, until the evolution of gas has ceased and all the iron is precipitated. Let the dense precipitate subside and decant the supernatant liquid. Mix the residue with enough water to restore the original weight; let subside, and again decant. Mix the two decantates, pour the solution upon a filter, and when all has passed through, pour the sediment into the filter and wash it with water until practically free from calcium iodide. Unite all the filtrates and evaporate the mixture until a dense pellicle forms over the surface and boiling continues only at a narrow vent. Now pour the fused salt into a shallow plate of suitable size, cover it well, and when cooled, detach the hardened mass, break it up and preserve it in well-stopped bottles.

* From the *American Journal of Pharmacy*, May, 1883.

The Pharmaceutical Journal.

SATURDAY, JUNE 16, 1883.

Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

PROVIDENT DISPENSARIES AND PHARMACY.

THE occurrence of "Hospital Sunday" in the metropolis since the issue of the last number of this Journal has been the occasion of many earnest appeals and not illiberal responses on behalf of the sick poor of this great city. As a result many of the noble institutions of which the dwellers in London have just reason to be proud will receive timely help in tiding over financial difficulties such as are almost necessarily the chronic accompaniments of their every-day work. No one with a human heart would think of saying a word that would tend in the least degree to check the outflow of benevolence towards the vast amount of helpless suffering that is to be found on every side; and all will rejoice should it turn out that contributions this year reach a larger amount than in any previous year since this movement has been started. But many who will have done all that lies in their power to meet the urgent necessities pressed upon them, will know that there are some very unsatisfactory features recognizable in the hospital system, or perhaps, more correctly, want of system. One of these, in which the readers of this Journal are not very remotely interested, is the extent to which people of the working class, and even some of the tradesman class, are becoming educated to seek and receive medical advice and medicine gratuitously, long before the pinch has been reached at which, with a proper amount of self-respect, they would allow themselves to enter into competition with the really destitute for a share in available charitable medical relief. We use the word "educated" advisedly, because not only is that the tendency of the free and frequently indiscriminate relief which, up to a certain point, can be obtained by almost everybody that chooses to ask for it, but the practice is also sometimes inculcated by the very language in which appeals for subscriptions are couched. This point was well illustrated recently by the *Lancet*, when alluding to an appeal on behalf of a well-known metropolitan hospital, which was based on an assumption that it was necessary to provide for the medical relief of a number equal to the whole population of the quarter of the metropolis in which the institution was situated. Nevertheless, it was estimated that amongst that population there were at least as many persons capable of subscribing five shillings a year as might thus make up a sum more than double the amount of the entire ordinary subscription of the hospital. Whilst, however, the number of patients receiving free relief in this particular district goes on increasing rapidly, attempts to cultivate more self-reliance in this direction among the working classes in the district have not been successful, and in the words of a clergyman who has made the trial, "it is hopeless to expect that they will put "aside even a penny a week for medicine and a "doctor's attendance when they can obtain as much "for the mere asking."

Like the results from most evil practices the influence of this demoralization, for such it undoubtedly is, cannot be confined to those with whom it originates; in fact its effects upon the practice of medicine, as well as of pharmacy, are most injurious. It is in just the localities where it obtains that medical men are to be found eking out an insufficiency of inadequately remunerated practice by dabbling in a business for which they have had no training and competing with neighbouring chemists—not for the dispensing of prescriptions, since there are none—but for the privilege of supplying the public with drugs and chemicals and even the "et ceteras" which are looked upon as excrescences of the chemists' stock-in-trade. In doing so they assimilate their establishments in every respect to a shop, and obliterate every characteristic feature that would help the general public to distinguish between the doctor and the druggist. It is not, therefore, surprising that, as one result of this confusion, the British workman, and many above him in the social scale, should fail to discriminate between the "doctor" who is always to be found behind his coloured bottles and the "doctor" who goes out visiting, or that they should resort to the chemist's shop for remedies in such cases of illness as do not seem to them to necessitate the loss of time involved in attendance at a hospital or the expense consequent upon consulting a regular medical practitioner. Neither is it to be wondered at that the chemist in the absence of occupation with his legitimate work, and pressed by the trade competition of his medical neighbour, should sometimes put a rather wide construction on the phrase "simple ailments." At any rate it is in respect to districts where the barriers between medicine and pharmacy are thus thrown down that complaints are loudest from medical men concerning what they are pleased to term "chemists' prescribing." In saying this we do not lose sight of the fact that for the existing confusion between medicine and pharmacy the "apothecaries" are largely responsible, in that their acquisition of the privileges of the medical profession did not induce them to curb more effectually their trading instincts. For this reason we are inclined to think that some of the arguments used

in the recent petition of the Society of Apothecaries to Parliament for reinstatement on the Divisional Medical Board, especially those relating to the supply of medicine, were just such as should militate against the granting of the request.

There is no immediate prospect of pharmacists in Great Britain obtaining the same amount of protection as is afforded their *confrères* in down-trodden Ireland, where the right of a medical man to dispense prescriptions is strictly limited to the dispensing of those written by himself. It is true that, as may be seen from a report on another page, just now the continuance of this protection is endangered by an alteration made in the Medical Bill now before the House of Commons during its passage through the upper House; but the committee of the Irish Pharmaceutical Society that has the business in charge will probably—*more Hibernico*—succeed in impressing Parliament with the justness of its claims. But British pharmacists can only hope to attain at some future day to the privileges already enjoyed by the pharmacists of the sister isle. Meanwhile, we are glad to welcome any movement that, by helping to diffuse sounder notions among the public as to the reasonable remuneration of medical services rendered, will also tend to remove the conditions which are so detrimental to the best interests of medicine and pharmacy; for we are strongly inclined to believe that every retrogression from the questionable position taken up by many medical practitioners upon the domain of pharmacy will be at least balanced by an equal abandonment of doubtful points by pharmacists. It will probably be only in proportion as medical men find themselves able to confine their operations within the limits to which their studies have been particularly directed, and pharmacists are left to do the work for which they are specially qualified, that the jealousies and bickerings concerning "counter prescribing" *et hoc genus omne* will disappear.

As indirectly promoting the attainment of this end we think it is very satisfactory to find that considerable progress has been made lately in establishing self-supporting medical institutions for the industrial classes in London under the auspices of the Provident Medical Association. At a meeting of the supporters of this movement, recently held at the residence of Sir CHARLES TREVELYAN, it was stated that since 1881 six new provident dispensaries have been established in different parts of the metropolis, three others that were previously in existence have been taken over by the Association, and arrangements are being made for the starting of four more. Of the nine provident dispensaries at present in operation, three have already become self-supporting, four are making steady progress towards that position, and concerning the other two, notwithstanding that they are heavily weighted through having to compete with medical charities in the same neighbourhoods, hopes are entertained that they will eventually pay their own way. About fifteen thousand persons of both sexes and all ages are now entitled, in virtue of a money payment, to medical aid, when required, from these dispensaries, and the number is increasing daily. We hope that the progress will be maintained until the objects of the Association are fully attained. Apart from the fact that, in the words of the Chairman of the meeting, "there could "be no greater misfortune happen to the country "that that men should lose the sense of inde- "pendence and self-reliance, and seek to obtain all "they require by State-aided schemes, municipal "government and public charity," the creation of a more healthy tone in the public mind in regard to responsibilities in respect to the receipt of medical assistance must help to improve the position of a large number of medical practitioners, and this, for the reasons before hinted at, cannot happen without conferring a similar boon upon the practitioners of pharmacy.

We understand it has been decided by the Council of the Pharmaceutical Society to extend a privilege until now limited to Members and Associates in Business, and supply gratuitously to each Associate and Registered Apprentice of the Society who chooses to apply for it a copy of the Catalogue of the Society's Museum. We hope that this boon will be widely appreciated, for the volume is of much wider interest than is implied by the title, and would prove a valuable addition to the library of any student of materia medica, even though he might never enjoy the privilege of seeing the museum to which it specially refers.

* * *

On Monday the second reading of the Medical Acts Amendment Bill was postponed until Thursday, but at the time of going to press it has not been reached, and judging from its position on the business paper it is hardly likely to be. Two deputations have been received this week by Mr. Mundella on the subject of the constitution of the proposed Medical Boards, one from Scotland urging the predominant claims of universities to representation, and the other from Ireland seeking the restoration of the Apothecaries' Society of Ireland to the position it originally held in the Bill. Replying to the latter, Mr. Mundella said that there had been great opposition to either the English or the Irish Society of Apothecaries being empowered to send representatives to the respective Medical Boards, to which also the report of the Royal Commission had been unfavourable, and eventually a compromise had been arrived at in the House of Lords between Lord Cairns and the Lord President to eliminate both those bodies. He promised to lay the views of the deputation before Lord Carlingford, but said he was unable to hold out any hope of the desired reinstatement in teeth of the agreement made.

* * *

The Commission appointed by the French Chamber of Deputies to examine the Pharmacy Bill introduced by M. Faure, has just agreed upon its report, and the principal recommendations in it have been communicated to the public press by M. Naquet, by whom it was drawn up. These are

(1) the suppression of pharmacists of the second class and of herbalists; (2) liberty of sale by any person of a series of harmless plants and drugs, included in a list to be inserted in the Codex; (3) liberty to pharmacists to sell, upon their own responsibility and that of the buyer, any substances, whatever may be their nature, which are expressly demanded by the purchaser, but not to grant consultations or practise medicine, unless they possess the double qualification; and (4) that any person possessing the diploma of a pharmacien shall have the right to prepare, advertise, and sell by wholesale and retail any medicine that is not "secret," in the grammatical sense of the word, that is, of which the composition is known. Whilst the subject was under consideration the Commission refused categorically to hear any outside opinions; but after the report had been drawn up, it gave an audience to the Minister of Commerce, and made some modifications to meet his wishes in favour of the retention of certain existing regulations as to the sale of poisonous substances and the inspection of pharmacies.

* * *

It is announced that Professor Lord Rayleigh has been nominated by the Council of the British Association as President for the meeting at Montreal in 1884. It has been suggested in an American contemporary that if next year's meeting of the American Association for the Advancement of Science could be fixed for some north-eastern city in the States, sufficiently near to Montreal, and could be timed so as to occur a week before or after the meeting of the British Association in the latter city, many members of each Association would be able and willing to attend both meetings.

* * *

A case is undergoing investigation at Partick, near Glasgow, in which the death of a young man followed the administration of a medicine made up from a prescription under conditions appearing to indicate that the man was poisoned. It has been suggested that a mistake was made in dispensing the mixture, but the information received up to the present time is not sufficient to justify us in offering any opinion on the subject.

* * *

The Edinburgh Chemists' Assistants and Apprentices Association has issued a circular announcing its intention to offer for competition among the Apprentice members two prizes, one of the value of £2 2*s.*, and the other of 12*s.* 6*d.*, and to these the President of the Association has added a third. The subjects of the examination, which is to take place in October next, are—Latin, English, Arithmetic, Elementary Chemistry, and some questions on the processes by which the official decoctions, infusions, pills and tinctures are made.

* * *

The Council of the Sanitary Assurance Association had before it this week a resolution asking it to consider whether it could not recommend legislation making it compulsory on builders of all new dwellings to obtain an authoritative certificate as to the sanitary condition of such houses before it shall be lawful for them to be used as habitations. Eventually, a sub-committee was appointed to draw up a Bill, if it should be deemed desirable, and report to the Council.

* * *

While referring to this subject it may be mentioned, that on Saturday, the 16th inst., Mrs. Buckton will give, in connection with the Health Society's exhibition at Knightsbridge, the last of a series of three demonstrations upon models of a sanitary and an unsanitary house.

* * *

A conference between a committee representing the interests of proprietary medicine manufacturers and dealers and a representative of the Massachusetts Pharmaceutical Association has resulted in agreement in respect to a plan to be recommended for adoption as likely to prevent the continuance of the "cutting system" in selling such articles. The proposition is that all proprietary articles shall be sold by the jobbers in the first place at a reduction of two-pence in the shilling upon the retail price, each package having a coupon attached to be removed at the time of sale by the retailer, and which shall entitle him to a further specified rebate, provided that he does not in the meanwhile render himself liable to complaints for underselling. It is not, however, clear what is to prevent the removal of the coupons and the claiming of the rebate before the goods are sold, if the retailer chooses to make a false statement.

* * *

From time to time reference has been made in this country to the advantages presented by the arrangement under which in the United States imports of drugs of inferior quality are intercepted at the custom house; but in the light of a statement in one of our exchanges this guardianship would appear to be a broken reed to lean upon. According to the *Oil, Paint and Drug Reporter* an application was made recently to the bureau of statistics at Washington for information as to the quantity of "cassia vera" annually imported into the country. The preliminary question, "What is cassia vera?" proved a stumbling block, and after it had been passed from one *employé* to another it was discovered that the sum total of the knowledge on the subject possessed by the custom-house experts was that there are two articles of a similar character, called cinnamon and cassia, the former coming from Ceylon and paying a duty of twenty cents per pound, the other coming from China and paying only half that amount of duty. Inquiries spread over a wider area raised the doubt whether the greater part of the cinnamon imported into the United States during recent years has not been entered—and passed—as cassia, payment of the higher rate of duty being thus avoided.

* * *

We are glad to notice that within about eighteen months of its first publication, Mr. Joseph Ince's capital little 'Latin Grammar of Pharmacy' has reached a second edition. There can be no doubt as to the usefulness of such a book to pharmaceutical students.

* * *

At the meeting of the Chemical Society on Thursday next there will be a ballot for the election of Fellows, and the following papers will be read:—"On Evaporation in Vacuo," by Professor H. McLeod, F.R.S.; "Note on Hydrocarbons from Camphor," and "Note on some Substitution Derivatives of Camphor," by Professor H. E. Armstrong; and "On the Decomposition of Ammonium Nitrate, an Investigation into the Rate of Chemical Change," by V. H. Veley.

Pharmaceutical Society of Ireland.

MEETING OF THE COUNCIL.

The monthly meeting of the Council of this Society was held on Wednesday, June 6, in the College of Physicians, Dublin, at three o'clock.

The President, Professor Tichborne, in the chair.

The other members of the Council present were:—The Vice-President, Dr. Aquilla Smith, and Messrs. Allen, Brunker, Doran (Bray), Draper, Grindley, Hayes, Hodgson, McIlwaine (Newry), Simpson and Wells.

Mr. Hugh J. Fennell, the Registrar, read the minutes of the last meeting and of a special meeting, which were confirmed.

Read, a letter from Mr. W. J. C. Miller, Registrar of the General Medical Council, enclosing a printed circular from Dr. Quain, Chairman of the Pharmacopœia Committee of that Council, stating that the Committee was very desirous of enlisting the co-operation of the several medical and pharmaceutical authorities in the bringing out of the new edition of the Pharmacopœia, and inviting suggestions with that view, which it was stated would receive most attentive consideration.

Mr. Draper said the office of making suggestions was a very thankless one.

The President: I think it should be courteous to reply to the letter.

Mr. Brunker: I think it would be well to appoint a Committee on the subject, which could report to the Council.

The Vice-President: The book will not be published for two years.

Mr. Hodgson: How did the Pharmaceutical Society of Great Britain take it up?

The President: We should be rather stultifying ourselves if we took any action on this letter when we are memorializing the Government to give us representation on the Medical Council.

Mr. Hodgson: I do not see how we can give suggestions to a committee on which we are not represented and of which we think we ought to be a component part.

The President: I would suggest that for the present, Mr. Fennell be directed to acknowledge the receipt of this letter. We can take up the matter afterwards, if necessary.

An order was made accordingly.

The President submitted a correspondence with Mr. Carteighe, President of the Pharmaceutical Society of Great Britain, showing the action which that Society had taken for the purpose of obtaining the insertion in the Medical Acts Amendment Bill of a clause providing that pharmaceutical authorities shall be represented on the Committee intended to be established under the Bill for the revision of the Pharmacopœia. The correspondence included copies of the memorial and petition which the English Society has adopted on the subject.

The President said that the Council had already discussed this point about the representation and the English Society was pressing on. It was requested, however, that no petition should be sent in until the Bill was going into Committee. But there was another point which the English Society did not seem to have taken cognizance of. One of the clauses of the Medical Bill provided that the "general medical practitioner," who had passed the State examination, should have a right o compound prescriptions. As the law at present stood medical practitioners were only given the right to compound prescriptions for their own patients. When the Bill in question was in the House of Lords an alteration was made in the clause in question, apparently advisedly, the effect of which would be to give every man who should have passed the State examination, the power of compounding for the public. The Apothecaries' Hall of Ireland had already petitioned against this; and he (the President) thought it was the duty of the Pharmaceutical Society of Ireland, also, to petition against it.

Mr. Brunker: It does not affect the English society so much as it affects us.

The President: It does, because if the clause as it stands becomes law, surgeons may not only compound for themselves but also for the public. I think a committee should be appointed to report on the two matters. It should be done at once. The clause should be altered by the introduction of the words "for their own patients."

Mr. Draper: I think it is a very important point.

On the motion of the President, seconded by Mr. Allen, a Committee, consisting of Mr. Draper, Mr. Hayes and the mover and seconder, were appointed to draw up a petition to the House of Commons, praying for amendments in the Medical Acts Amendment Bill in reference to the revision of the Pharmacopœia and the open dispensing for the public by general practitioners.

As it would be necessary to take action in the matter before the expiration of a month, the President and Registrar were empowered to affix the seal of the Society to whatever petition the Committee drafted.

A letter was read from Dr. J. W. Moore, Registrar of the College of Physicians, stating that as that body were pressed for library space, they were anxious to resume possession of the room rented by the Society; but they wished to afford the Pharmaceutical Society ample time to make the arrangements consequent on its surrender of the room.

The President said a committee had better be appointed to consider what should be done.

Mr. Hodgson observed that if they rented premises for themselves they would have to incur a considerable amount of expense in fitting them up so as to make them suitable for their purposes. They would have to buy furniture for an examination room. The £400 they had in hand would go a very little way towards that. Why should they not follow the example of the College of Physicians and raise funds by the issue of debenture stock for the erection of a building suitable for their requirements?

The Vice-President said that the College of Physicians raised first £6000 and afterwards £2000 more by the issue of debenture stock, and now it was all paid off.

Mr. Hodgson said that the Society had sustained a loss in its last year's operations. The income from fees had been £190, and the income from subscriptions, £78. Against that the expenditure had been £238, exclusive of rent and the cost of prosecutions, and some other matters, which would bring it up to £314.

The Vice-President: There has been a falling off in the number of members during the last few years.

The President said the matter was a very important one, and should receive careful consideration. A committee should be appointed with full power to make inquiries as to what premises could be had, and as to whether it would be desirable for the Society to hire rooms or to issue debenture stock for the purpose of providing a building of its own.

On the motion of Mr. Brunker, seconded by Mr. Doran, the following committee was appointed for that purpose:—The President, the Treasurer, Messrs. Draper, Grindley, Simpson, Hayes, and the mover and seconder.

A letter was received from Mr. Henry Webb, of Kanturk, complaining that a person who was neither an apothecary nor a pharmaceutical chemist had opened shop and was compounding prescriptions in that town.

Mr. Hodgson: Mr. Webb is not a member of the Pharmaceutical Society.

The Register was directed to inform Mr. Webb that as he was not a pharmaceutical chemist the Society could not entertain his letter.

A letter was read from Mr. Bernard J. Costello, of Killarney, in reference to his candidature for the office of

apothecary of the Killarney Workhouse, and complaining of the result of the election.

The Registrar was directed to refer Mr. Costello to the Local Government Board.

A letter was read from Mr. Samuel Curham, dated May 26, and stating that he had been informed that the Council had passed a resolution that candidates who had not passed the Preliminary examination previous to January, 1883, would have to serve an apprenticeship of four years, but that that resolution was not to come into force until January, 1884. He wished to know whether candidates passing the Preliminary examinations to be held in July and October next would be admitted after two years' service. He also asked for information on another point. Mr. Hardy, who was a partner of Mr. Beater, of Sackville Street, and who passed the pharmaceutical examination some time ago had, by agreement with the firm, opened on his own account and responsibility, a compounding department in the premises of the said Beater and Co. Would an apprenticeship served to him, and his certificate thereof, be accepted by the Council?

The Registrar said he had already answered the first of the questions asked by Mr. Curham by informing him that any candidate who had not passed the Preliminary examination before April, 1883, would have to spend four years in the study of practical pharmacy.

The President: I think our best course with reference to the other question is to inform Mr. Curham that we cannot give a legal opinion. You have refused a certificate in the case of Mr. Middleton; he has appealed, and you are awaiting the result of that appeal.

Mr. Hodgson said it was hard upon Mr. Curham not to be able to give him an answer at once.

Mr. Brunker: We are not in a position to say that we cannot accept his certificate.

Mr. Hayes: I think we are in a position to say that we must refuse his certificate; and then he can appeal to the Castle as Mr. Middleton did.

Mr. Hodgson moved the following resolution:—

"That having refused a similar application, and as an appeal has been carried to the Privy Council, we await the result of that appeal before giving Mr. Curham a decided answer."

Mr. Brunker seconded the motion, which was passed unanimously.

The President gave the following notice of motion:—

"That on and after the 1st of October, 1883, the office of President of the Society shall not be held for more than three consecutive years by the same person."

A letter was received from Mr. Thomas S. Hance, of Limerick, in reference to the refusal of the Council to accept certificates given by him on the ground of his not keeping an open shop. He maintained that he did keep an open shop for the compounding of medical prescriptions and the preparation of medicine in general. The Local Government Board had sanctioned his taking pupils in pharmacy, under prescribed rules, a copy of which he enclosed. He had been giving certificates for four years and these had never been questioned by any other medical board in the three kingdoms. Between 40,000 and 50,000 prescriptions, he said, were prepared annually under his personal superintendence, and he submitted that the Act of Parliament did not mean that because a qualified man kept an open shop within certain gates and did not receive money over the counter he was not to have his legal rights.

Mr. Brunker: I think we are right in our decision. He does not keep an open shop. He keeps the dispensary of the workhouse.

Mr. Wells: If he only has a shop within the workhouse walls it is not an open shop.

The consideration of the letter was postponed in order that inquiries might be made.

A report from the Certificate Committee was adopted.

Mr. Hodgson said he had been requested on the previous day by an apprentice, who was about being bound, to obtain an answer to the following question:—The 32nd section of the Pharmacy Act provided that upon the decease of a pharmaceutical chemist or chemist and druggist, his executor, administrator, or trustee, might carry on his business so long as it was *bonâ fide* conducted by a duly qualified assistant who should be a pharmaceutical chemist or a chemist and druggist. Would the certificate of the party carrying on the business in such a manner, given to an apprentice, be accepted for the Major examination?

Mr. Brunker: As a matter of fact such certificates have been recognized and have never been questioned.

Mr. Hayes: If the establishment is kept open regularly and according to the requirements of the Act, I do not see how we can refuse the certificate. I think you may definitely answer that the certificate will be accepted.

The Council then adjourned.

Provincial Transactions.

BRISTOL PHARMACEUTICAL ASSOCIATION.

The annual meeting of the above Association was held at the "Museum and Library," Bristol, on Friday, June 1, the President, Mr. G. F. Schacht, in the chair.

The report of the Council was read by the Honorary Secretary, Mr. Warren, and the statement of accounts, which showed a balance in hand of £2 5*s*., by the Treasurer, Mr. White.

These were approved and formally adopted.

The new Council was then elected. It consisted of Messrs. Allen, Berry, Pitman, Schacht, Stroud, Warren, White and Wretts.

A communication, addressed to the President and members of the Bristol Pharmaceutical Association by the Registrar of the General Medical Council, and accompanied by a "memorandum" signed by the Chairman of the Pharmacopœia Committee, was submitted for consideration and was fully discussed.

It was unanimously resolved that the incoming President be requested to reply upon the following lines:—

"To W. J. C. Miller, Esq.,

"Registrar of the General Medical Council.

"Sir,—As President of the Bristol Pharmaceutical Association, I duly received on the 19th ult. a communication from yourself and a circular signed by the Chairman of the Pharmacopœia Committee, in which the Association was invited to 'offer suggestions with a view to rendering a new edition of the British Pharmacopœia as complete and accurate as possible.'

"The documents were in due course laid before the Association and were fully considered.

"I am now requested to reply that the Bristol Pharmaceutical Association is of opinion that the Pharmaceutical Society of Great Britain is the recognized centre of pharmaceutical activity in this country, its claims thereto being identical with those by virtue of which the General Medical Council represents medicine, namely, the decrees of Parliament, and, therefore, that any application on the part of the Pharmacopœia Committee for practical pharmaceutical co-operation in the construction of a National Pharmacopœia ought to be made primarily, if not solely, to the Pharmaceutical Society of Great Britain.

"I am further requested to say, on the part of the individual members of this Association, that they would feel disinclined to offer any suggestions upon the important subjects submitted to them except at the request and through the medium of their official representative

the Council of the Pharmaceutical Society of Great Britain.

"I have the honour to be, Sir,
"Your obedient servant,
"
"*President, Bristol Pharmaceutical*
"*Association.*"

MIDLAND COUNTIES CHEMISTS' ASSOCIATION.

A meeting of the General Committee of the above Association was held at 23, Burlington Chambers, New Street, Birmingham, on May 31, 1883. The President (Mr. Joseph Lucas) in the chair.

Mr. Stokes Dewson having tendered his resignation as Honorary Secretary to the Association, the following resolution was unanimously carried, "That Mr. Charles Thompson and Mr. Alfred Wright be requested to act as joint Honorary Secretaries to the Association *pro tem.*"

Proceedings of Scientific Societies.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of this Association was held on Thursday, June 7. Mr. R. H. Parker, Vice-President, in the chair. Mr. C. Ranken read a paper upon:—

Some Old and New Theories concerning the Vegetable Cell.

After pointing out the necessity of a knowledge of the elementary parts of vegetable tissues in physiological botany, the author proceeded to review some of the most important theories which have been advanced to account for the different phenomena presented by cells, starting with Robert Hooke's observations, which showed that tissues were composed of a continuous homogeneous substance, permeated by innumerable cavities, but did not recognize the individuality of cells. Malpighi first pointed out that cells were separable one from another, and gave to each the name "utriculus." Wolff in 1780 again enunciated the homogeneous theory, which was held by some physiologists for a considerable period, Huxley writing in its favour in 1853. The discovery of the *nucleus* by Robert Brown gave rise to an amount of controversy; some botanists doubted its existence, whilst Schleiden made the belief in its existence the "first article of the faith botanical." Nägeli contended that it was a universal and unexceptional phenomenon in vegetable cells. Huxley looked upon both protoplasm and nucleus as accidental anatomical modifications of the primordial utricle. It is only within a comparatively few years that histologists have been able to demonstrate clearly the true distinctions which exist between the cell-wall and the cell-contents; most agree with Beale's definition which describes cells as consisting of three parts: (1) germinal matter or bioplasm; (2) formed matter or tissue; (3) nutrient matter. The bioplasm or protoplasm, being the most important part of the cell, is the immediate cause of cell formation and every process of organic life. The theories advanced to account for the growth of the cell-wall were next noticed, and a detailed account of Nägeli's intussusception theory was given, which shows that the substance—probably some soluble carbohydrate readily converted into cellulose—is diffused between the micellæ of the cell-wall, where it becomes deposited in the solid state either upon the pre-existing micellæ, or it forms new micellæ, by which means the wall increases in size and thickness. An account of the growth of starch granules was also given.

In the discussion that followed, the Chairman, Secretary, Messrs Crow and Sewell took part. A vote of thanks was passed to Mr. Ranken.

The Reporter upon Materia Medica, Mr. W. Elborne, then made a Report upon Commercial Rhubarbs, which was copiously illustrated by specimens from the Museum of the Pharmaceutical Society.

Commercial Rhubarbs.

BY WILLIAM ELBORNE,
Assistant Curator of Pharmaceutical Society's Museum.

Rheum is the botanical name of the genus of plants yielding the important drug familiarly known as rhubarb. The genus, a member of the Polygonaceæ, consists of twenty species, natives of the Siberian Himalayas and the East. They are perennials, with large root-stocks, from which the large sheathing leaves and flower stalks are given off. The inflorescence consists of much-branched panicles bearing a great number of white or pinkish flowers which have a petaloid six-parted perianth, enclosing nine stamens attached to its base. The three-sided ovary is surmounted by three spreading styles. The three-cornered fruit is winged and encircled at the base by the withered remnants of the perianth.

The fact of rhubarb being one of the most ancient valuable remedial agents of our materia medica will perhaps admit of a few preliminary remarks concerning its history.

The properties of rhubarb, which appear to have been known from a very remote period, find their earliest record in the Chinese herbal called 'Pen-king,' supposed to have been written about 2700 B.C.

As regards the ancient literature of Western Asia and Europe, it also occurs in the early writings of Dioscorides and Pliny; but whether then produced in the regions of Asia Minor or merely received thence from remoter countries, is a question which cannot be solved. A sketch of the history of rhubarb would be comparatively incomplete without some reference to the various routes by which the drug has been conveyed to Europe from the Western provinces of the Chinese empire and which have given rise to the familiar designations of Russian, Turkey and China rhubarb.

The first route is that over the barren steppes of Central Asia by way of Yarkand, Turkestan and the Caspian, to Russia; the second by the Indus or the Persian Gulf to the Red Sea and Alexandria, or by Persia to Syria and Asia Minor; and the third by way of Canton, the only port of the Chinese empire which previous to the year 1842 held direct communication with Europe. In 1653 China first permitted Russia to trade on her actual frontiers. The traffic in Chinese goods was thereupon diverted from the line of the Caspian and Black Sea further north, taking its way from Tangut across the steppes of the high Gobi and through Siberia by Tobolsk to Moscow.

Consequent on the rectification of the frontier in 1728, a line of custom houses was established by treaty between Russia and China, whereby the commerce, previously restricted, was limited only to the Government caravans which passed the frontier at Kiachta and Maimatchin, which towns ultimately became the staple depôts of rhubarb. In 1704, the Russian Government monopolized the trading in this drug and caravans fitted out by the Crown alone brought the drug to Moscow.

Under the surveillance of the Russian Minister of War, a special office was established at Kiachta, where the whole of the drug was submitted to careful inspection and examination by competent apothecaries, with the object of removing inferior and spurious pieces and to improve the selected drug by trimming, paring and boring. It was then dried and packed in chests which were sewn up in linen and rendered impervious to wet being pitched.

So long as China kept all her ports closed to foreign commerce, except Canton in the extreme south, most of the finest rhubarb consequently found its way to Europe

by way of Russia. Owing, however, to the unpleasant accompaniments of the Russian supervision being so rigorously exercised, the Chinese were very ready to accept any easier and more reasonable outlet for their goods: consequently we find that the opening of a number of ports in the north of China exerted a most depressing influence on the trade of Kiachta. Thus the overland rhubarb trade became gradually destroyed, inasmuch as the Chinese, tempted by the increased demand from the trading ports, became negligent in the art of growing and collecting the root with such scrupulous care as formerly insisted upon by the Russian Government. Thereby the so-called Russian, Muscovite, or Crown rhubarb, which, from its uniformly good quality long enjoyed the highest reputation, has become a thing of the past and can only now be found in museum collections.

The second route is by the Indus or Persian Gulf to the Red Sea and Alexandria, or by Persia to Syria and Asia Minor.

From the Levant ports of Aleppo, Tripoli, Alexandria and Smyrna, it reached Europe and became known as "Turkey" rhubarb. This, however, did not long survive the Russian route; and as the imports in this direction ceased, the same name of "Turkey" was erroneously applied to the drug brought again by the original route through Russia.

The third line is by way of Chinese ports, hence our supplies from these quarters being known as Chinese, "Canton" or East Indian rhubarb.

With the view of classifying the numerous varieties of the drug the rhubarbs may be divided into two great classes, namely, those which are produced in Central Asia, and those which are cultivated in Europe.

Asiatic Rhubarbs.

Chinese	Russian, Muscovy or Turkey.	yielded by	*Rheum palmatum* var. *Tanguticum*? or *Rheum officinale*?
	Canton or East Indian.		
	Batavian or Dutch, trimmed.		
Siberian		„	*R. rhaponticum.*
Himalayan (large)		„	*R. Emodi.*
„ (small)		„	*R. Webbiani.*
Bucharian		„	*R. undulatum.*

European.

English	„	*R. rhaponticum.* *R. officinale.*
French	„	*R. rhaponticum.* *R. compactum.* *R. undulatum.*
Austrian (Moravian) . . .	„	*R. rhaponticum.*

Asiatic Rhubarb, Chinese.—Owing to the fact that the greater part of the regions of Shensi, Kansu and Szechuen, where the plants grow, is as yet unexplored by botanists, and, perhaps, owing to the jealous reticence of the Chinese, the exact species yielding the true drug is not known with certainty.

The bulk of the commercial drug imported into this country, however, is considered to be afforded by two species, viz.:—*Rheum officinale* and a variety of *R. palmatum*, called *tanguticum*. The former is a native of the south eastern part of Thibet, and of various parts of West and North-Western China, where it is in a measure cultivated. The second species is said by Prejevalsky, a celebrated Russian colonel, to afford the excellent rhubarb of Thibet.

China rhubarb, as imported into Europe, consists of portions of a massive root which display considerable diversity of form, arising from the various operations of paring, slicing and trimming to which they have been subjected. Thus some pieces are cylindrical or rather barrel shaped, others conical, while a large portion are plano-convex. These forms are not found in the same package, the drug being usually sorted into what are commonly known as "rounds" and "flats." In dimensions we find them from 4 to 6 inches in length, and about 2 inches thick. The outer surface of the root is somewhat shrivelled, often exhibiting portions of dark cortical portions that have not been pared away.

Many pieces are pierced with a hole in which may be found the remains of the string used to suspend the root while drying.

The drug is dusted over with a bright yellowish powder, on removal of which the outer side of the root is seen to have a rusty brown hue, or viewed with a lens to be marked by the medullary rays, which appear as an infinity of short broken white lines traversing a brownish ground. The character which most readily distinguishes the rhubarb of China is, that well-developed pieces broken transversely display these dark lines arranged as an internal ring of *star-like spots*. Although this character is by no means obvious in every piece of Chinese rhubarb, it is of some utility from the fact that in European rhubarb such spots are generally wholly wanting or at most occur very sparingly and isolated.

Although Russian rhubarb has ceased to be an article of commerce since 1860, a few remarks respecting its character will not be out of place when we consider the very high repute it has always maintained and the many attempts made at the present day of slicing and trimming the East Indian drug with a view of simulating it.

The true Russian rhubarb, which is now very scarce, appears as though it had been freely sliced with a sharp knife, and each piece shows evidence of having been rigorously examined and inspected, by possessing a *large* hole (not a string hole) bored to its centre by the authorities at Kiachta. Another very distinguishing character is the net-veined appearance of its outer surface.

East Indian rhubarb of commerce is the variety which is chiefly imported to England. It is supposed to be derived from the same species as the former and distinguished by the small size, dark colour, and irregular shape of the holes with which it is pierced, these holes being generally plugged with the remains of string used in drying; also by the outer surface being frequently marked with whitish reticulations, which are more evident when the powder has been rubbed off, and by the transverse surface showing a number of star-like marks, but no distinct cortical layer. Canton stick rhubarb is probably obtained from the root branches of the same plants.

East Indian rhubarb is now purchased for the European market chiefly at Hankow on the upper Yangtsze, whither it is sent to Shanghai for exportation. The exports from Shanghai in 1878 were 5942 *piculs* (picul = 133⅓ lbs.), valued at £40,000. Since that date no return, to my knowledge, has been issued.

Batavian or Dutch trimmed differs from the East Indian in having an angular appearance, owing to the surface having been sliced off. It is not now met with in English commerce as a distinct variety, but used to be imported from Canton and Singapore.

Siberian Rhubarb.—Small quantities of this kind have been imported occasionally, and have been proved to be those called by Grassman and others Siberian rhapontic root. This occurs in long, thin, almost cylindrical or spindle-shaped pieces, decorticated and perforated by a hole. Since it is yielded by the same species which is cultivated in England at Banbury, Dr. Pereira has justly compared it with English stick rhubarb.

Himalayan Rhubarb.—The cultivation of rhubarb in India has hitherto been unsuccessful rather than otherwise. The large Himalayan root is, however, furnished by *Rheum Emodi*, a large plant having a thick stem, growing from Bhotan and Sikkim to Kaschmir on the India side of the Himalayas, frequently reaching a height of more than 6 feet, and also indigenous to Western Thibet, but less abundant. In most districts of North-Eastern and Central Asia its efficacy is greatly praised, while in the damp and warm districts of Sikkim and Bhotan the root

seems to be ineffieaeious. The smaller rhubarb of *Rheum Webbianum* is indigenous to the vicinity of Simla, at an elevation of more than 12,000 feet; it was tried by Dr. Royle in both military and civil hospitals at Saharunpore, and found to be of very good quality. Both varieties differ much in appearance from that of the Chinese drug, in that the brown cortical portion of the root has not been removed. The texture is radiated, rather spongy and the colour of the powder a dull brownish yellow.

Bucharian Rhubarb, whieh makes its way to Vienna by Brody and Nischny, seems, from specimens and information afforded by Faber to Dr. Pereira, to consist of inferior kinds of the Russian drug.

European Rhubarbs.

In various parts of Europe, particularly in England, France and Germany, the rhubarb plants have been cultivated for many years.

English Rhubarb occurs generally in two forms, one in which the root is cut, trimmed and bored in imitation of the Russian; the other in sticks. The former occurs in various sized flat and irregular pieces, commonly about 6 inches long. English rhubarb is lighter and more spongy than the Asiatic, and when broken exhibits a more regular marbling, the pink lines being arranged like rays from the centre towards the circumferenee. The star-like spots are either wanting or very sparingly scattered. The whole of the English rhubarb in the market is grown by Mr. Rufus Usher, at Bodicote, near Banbury. To him I am indebted for his kindness in having furnished me with authentie specimens of the home-grown roots of *R. rhaponticum* and *R. officinale*, and also with statistics relative to the annual production. He informs me that this amounts to 7000 lbs. of the drug, of whieh about 4000 lbs. is exported.

French Rhubarbs.—The rhubarbs of France are derived from *R. rhaponticum*, *R. undulatum* and *R. compactum*. That which comes from the department of Doubs is furnished by *Rheum rhaponticum*, and that from Provence by *Rheum undulatum*. French rhubarbs possess somewhat similar characters to those which exist in the Chinese drug. They, however, show such an analogy to each other that it is very difficult to distinguish from which species commercial samples of the drug may have been derived, since in appearance it much resembles the drug grown in England, and occurs in similarly shaped pieces. The remarks coneerning English rhubarb will apply equally to the French drug, the cultivation of which is rapidly decreasing.

Austrian.—This rhubarb occurs in smooth deeorticated pieees, fairly eompact, and weighing about 4 ounces each. It possesses a very clear yellowish appearance, with small reddish-brown spots interspersed. The transverse section of this rhubarb presents a regular radiate structure.

Of these several varieties of rhubarb, nearly all of whieh still constitute the commercial produets of countries abroad, only two varieties oceur in English eommeree at the present day, they are the Chinese (East Indian) drug (*R. palmatum*, var. *tanguticum*), and that grown in our own country (*R. rhaponticum*).

In the discussion that followed, the Chairman, Seeretary, Messrs. Corder, Crow, Hamilton and Ransom took part.

SOCIETY OF CHEMICAL INDUSTRY.

Chemistry and Analytical Examination of Fixed Oils.*

BY ALFRED H. ALLEN.

(*Concluded from page* 1031.)

I fear I owe the Society an apology for dilating so largely on the subjeet of the oil from marine animals, but the comparative novelty of the subject must be my justification, and in addition I may point out the very important bearing the peculiar chemieal constitution of these oils has upon the methods of deteeting their adulteration. That bottle-nose oil is now frequently substituted for sperm oil without acknowledgment is a fact well known, and the great similarity between them renders it difficult to devise any method by which the substitution can be positively deteeted, but the admixture of any of the ordinary oils with sperm or bottle-nose oil would be at onee detected by the saponifieation process, the fatty acids being increased and the ether residue diminished by any admixture of sperm or bottle-nose oil with a glyeeride. A properly-contrived mixture of a mineral oil with a glyeeride eould be made to simulate sperm oil in density, and approximately in the proportion of ether residue and fatty acids, but the sum of these two would be sensibly below 100, instead of several units above, as in the ease of genuine sperm and bottle-nose oils.

I have already referred to the dependenee of the density of fixed oils on their chemical constitution, and it is of interest to see how far oils of similar ehemical character may be correctly grouped by their density. The following table shows the results of sueh arrangement when applied to the best-known fluid fixed oils:—

A.—OILS OF LESS DENSITY THAN ·883.

1. *Liquid Waxes*:

Sperm oil	·875 to ·883
Bottle-nose oil	·876 to ·880

2. *Unknown Constitution*:

Shark-liver oil	·865 to ·867
Afriean fish oil	·867

B.—OILS HAVING A DENSITY BETWEEN ·883 AND ·912.

Oil from the head-cavity of the bottle-nose whale (specific gravity ·908), giving on analysis figures proving it to be a mixture of a fluid wax and a glyceride.

C.—OILS HAVING A DENSITY BETWEEN ·912 AND ·92 (NON-DRYING OILS).

1. *Vegetable Oils*:

Almond oil	·917 to ·920
Earthnut oil	·916 to ·920
Olive oil	·914 to ·917
Rape or colza oils	·914 to ·917
Mustard oil	·914 to ·920

2. *Marine Animal Oils*: None.

3. *Terrestrial Animal Oils*:

Lard oil	·915
Tallow oil	·916
Neatsfoot oil	·914 to ·916
Bone oil	·914 to ·916

D.—OILS HAVING A DENSITY BETWEEN ·920 AND ·937.

1. *Vegetable Oils*:

(*a*) *Moderately drying*—Density below ·930.

Cotton-seed oil	·922 to ·930
Sesame oil	·923 to ·924
Sunflower oil	·924 to ·926
Niger-seed oil	·926 to ·928

(*b*) *Strongly drying.*

Hempseed oil	·925 to ·931
Linseed oil	·930 to ·935
Poppy seed oil	·924 to ·237
Walnut oil	·925 to ·926

2. *Marine Animal Oils*:

Cod oil	·923 to ·930
Menhaden oil	·929 to ·932
Seal oil	·924 to ·929
Porpoise oil	·920 to ·923
Whale oil	·920 to ·930

3. *Terrestrial Animal Oils*: None.

* Paper read before the London Seetion of the Society.

E.—OILS HAVING A DENSITY ABOVE ·937.

1. *Vegetable Oils—Purgative:*

Croton oil	·942 to ·943
Castor oil	·960 to ·964

(Boiled linseed oil.)

2. *Animal Oils*: None.

The peculiarity of the composition of the oils of Class A I have already referred to at length, and the single oil in Class B requires no further notice. The oils of Class C present a very close general resemblance. They consist chiefly of the glycerides of oleic acid and its homologues. Thus the oils from almonds, olives, lard, tallow, neatsfoot, and bones, consist mainly of triolein. Arachis or earthnut oil is peculiar in containing the glyceride of hypogœic acid, which stands in the same relation to palmitic acid that oleic does to stearic acid. Rape and mustard oils contain the glyceride of brassic or erucic acid, which is said to be homologous with oleic acid. The lead salt, however, is insoluble in ether, while oleate and hypogœate of lead are soluble. Oleic and hypogœic acids and their respective glycerides agree in yielding isomeric bodies of comparatively high melting point under the action of nitrous acid, while brassic acid does not yield a solid product under the same conditions. Similarly, rape and mustard oils, which in large part consist of the glyceride of brassic acid, give but little elaidin, that which is formed being doubtless due to the true olein present together with the glyceride of brassic acid. In Class D we have several distinct groups of oils. The chemistry of the oils of the cotton-seed group—which are sometimes called the "partially-drying oils"—is very imperfectly understood. The fatty acids obtained on saponifying cotton-seed oil have a remarkably high melting point, but can scarcely contain much palmitic or stearic acid, or the oil would be solid at ordinary temperatures. The true drying oils, of which linseed oil is the type, are well known to absorb oxygen with great facility, especially after being exposed to a high temperature. That they have a distinct chemical constitution from the non-drying oils is indicated not only by this fact, but also by their giving no solid elaidin with nitrous acid, and by their high density and fluidity. They also give a much greater increase of temperature when treated with strong sulphuric acid than is the case with the oils of either of the previous classes. Although, from their general resemblance to linseed oil, the oils of walnut, hempseed and poppy seed may be assumed to consist largely of the glyceride of linoleic acid, I am not aware that this has been definitely proved to be the case. It is worthy of notice that the animal oils which have a density higher than ·916 are in every case of marine origin. They yield but little solid elaidin, and hence contain but little true olein, in which respect they present a marked contrast with bottle-nose oil, which gives a fairly solid product, as also do its separated fatty acids. On the other hand, the "fish oils" do not dry readily; hence their chemistry is still somewhat obscure.

The only fixed oils which in a natural state have a density higher than ·937 are castor and croton oils. Castor oil has properties and constitution which appear to be perfectly unique. It consists chiefly of the glyceride of ricinoleic acid, $C_{18}H_{34}O_3$, is remarkably viscous, and has a density of upwards of ·960. It differs from all the other fixed oils (except croton oil) in its ready solubility in alcohol, being miscible in all proportions with absolute alcohol, and completely soluble at 30° C. in twice its volume of rectified spirit. But a still more remarkable peculiarity is its insolubility in petroleum spirit, which appears to be miscible in all proportions with the generality of fixed oils. Castor oil itself dissolves its own measure of petroleum spirit and somewhat less of the heavier petroleum products, but the mineral oil takes up little or no castor oil. For lubricating purposes it is often desired to effect a mixture of castor with mineral oil, and this is usually done by the addition of an animal olein.

The fixed oils which are solid at ordinary temperatures also vary in density according to their chemical constitution, those which contain glycerides of the lower fatty acids being distinctly denser than the fats consisting wholly of palmitin, stearin and olein. This fact, on the suggestion of Mr. J. Bell, has been utilized for examining butter. The following are the densities of molten fats at 100° C., compared with water at 15° C.

F.—FATS CONTAINING NO GLYCERIDES OF LOWER FATTY ACIDS.

1. *Vegetable Fats.*

Cacao butter	·857
Palm oil	·857
Japan "wax"	·873

2. *Animal Fats.*

Lard	·861
Tallow	·860
Horse fat	·861
Butterine	·859

G.—FATS CONTAINING GLYCERIDES OF LOWER FATTY ACIDS.

1. *Vegetable Fats.*

Cocoanut oil	·868
Palmnut oil	·866

2. *Animal Fat.*

Butter fat	·865 to ·868

The figures referring to the densities of the animal fats are by König, and it is not certain whether water at 4° or at 15° C. was taken as unity.

It will be noticed that melted "Japan wax" exhibits an anomalous density, and this is true also of the solid body. It is alleged to consist of nearly pure palmitin; but this seems highly improbable on several accounts. However, I find only 1·14 per cent. of unsaponifiable matter on saponifying and treating with ether, so that it is not a true *wax*, and the peculiarity probably lies in the nature of the fatty acid.

Although it will be seen that observation of the density of oils is capable of giving much more valuable information than is usually gleaned from the rule-of-thumb application of the test, the conclusions from the experiment are apt to be vitiated by the presence of any large proportion of free fatty acid. This will be evident when it is remembered that free oleic acid has a density not exceeding ·900 at 15° C., and hence rancidity generally tends to reduce the specific gravity of an oil. The error from this cause may be avoided by the troublesome plan of saponifying the oil, and taking the density of the resultant fatty acids. Unfortunately, there are not at present sufficient data to render the plan generally useful, but in taking observations of this kind I should strongly recommend the mode of operating adopted by Mr. L. Archbutt. He takes the density of the oil at a steam heat, and hence is able to compare all fatty acids, whether liquid or solid, at ordinary temperatures. For the experiment, he employs a small Sprengel tube, which is hung by the horizontal capillary portions in the neck of a 20-ounce flask, containing water in rapid ebullition. A watch-glass or porcelain crucible cover is placed over the neck of the flask so as to prevent cooling. Two little mouths on opposite sides of the neck of the flask allow the ends of the Sprengel tube to project, while the flask is pretty tightly closed by the porcelain cover. When no further expansion of the oil is observed to occur, the nose of the Sprengel tube is touched with a piece of filter paper, to remove adhering oil, and the tube is then removed, wiped dry, cooled, and weighed. Operating in this way, Mr. Archbutt has observed the following densities for fatty acids from various sources, compared with water at 100° C. taken as unity. For convenience I add some observations of melting points also observed by him.

Source of Fatty Acids.	Density at 100° C.	Melting Point Deg. F.
Pure olive oil	·8444	75 to 76
„	·8429	—
Earthnut oil	·8475	82·3
Pure rape oil	·8439	65
Colza oil	·8464	65
Cotton-seed oil	·8494	95·5
Niger-seed oil	·8562	76·5 to 80·0
Linseed oil	·8599	52·5
Train oil	·8597	87·0
Palm oil	·8389	—

In observing the melting point of fatty acids and similar substances very good results may be obtained by the capillary-tube method, provided that the following points are rigidly adhered to: (1) To allow the fat to solidify *slowly*, avoiding all artificial means of cooling. (2) To allow at least an hour to elapse after solidification before taking the fusing point. (3) To heat the water extremely slowly.

A convenient apparatus for taking fusing points consists of a 20-ounce flask, from which the neck has been removed. The flask is filled with water, and a small beaker fitted into the mouth, and itself filled with water. The capillary tube should be in close proximity to the bulb of the thermometer.

A good alternative method (due to Dr. Redwood) is to half fill the beaker with clean mercury, and place a small fragment of the fatty acid on the surface of the metal. The thermometer bulb must be wholly immersed in the mercury. The melting point is very readily observed, and several samples can be readily tested simultaneously. When sufficient of the fatty acid is available, Dalican's method of taking the solidifying point is very useful.

I have already pointed out several errors which the unsuspected presence of free fatty acid in an oil is apt to occasion. Another is the vitiation of the colour test for oils, based on the reaction of the sample with polysulphide of barium or calcium. Chateau, who first devised the test, and Muter, who modified it, observed that certain oils decolorized the reagent, whereas others gave a yellow colour. I believe the differences observed were mainly, if not entirely, due to the presence or absence of free acid in the samples of oil examined. Direct experiments made by mixing olive and cotton-seed oils with increasing quantities of pure oleic acid fully confirmed this view. Similar objections apply to the majority of colour tests for oils, the fact being that the albuminous, resinous and other foreign matters, on the presence of which the colour reactions depend, are more or less completely removed by the processes employed in refining the oil. A notable case of this kind is that of cotton-seed oil, which, in the unrefined state, gives a fine violet-blue colour with caustic soda, and a magnificent red with sulphuric acid. The violet colour produced on treating a liver oil with sulphuric acid is one of the most striking and reliable of the colour reactions of oils.

Among Chateau's colour tests for fixed oils is anhydrous stannic chloride, which has been applied by Renard to the detection of resin oil. On adding a drop of stannic chloride to ten or twelve of resin oil and stirring the mixture a fine purple colorization is produced. The test is a good and useful one, but anhydrous stannic chloride is not always at hand, and is troublesome to prepare. I have, therefore, employed stannic bromide instead, and find it to answer equally well. I make it by agitating bromine in a separator with strong sulphuric acid, to remove water, and then allow the bromine to drop slowly on granulated tin, contained in a well cooled flask.

Maumené's test for oils by observing the rise of temperature produced on mixing 50 grams of the oil with 10 c.c. of acid is a useful test dependent on the chemical constitution of the oils examined, and, when carefully conducted, it gives remarkably constant indications. The following are essential conditions of success: (1) Always to use an acid of exactly the same specific gravity, and to preserve it most jealously from the air. (2) To bring the oil and acid to exactly the same temperature before commencing an experiment. (3) To mix the oil and acid thoroughly by means of a thermometer, stirring the whole time, and not reading off the temperature till the mercury begins to fall. (4) To work with the same apparatus, and to prevent loss of heat by enclosing the beaker in a non-conducting substance. In the case of the vegetable oils, the rise of temperature increases very regularly with the drying tendencies of the oil—olive oil developing about the least heat and linseed oil the most. Among the oils from marine animals, sperm and bottle-nose oils give only a moderate rise of temperature, while whale and cod oils develop great heat.

In examining olive oil the elaïdin test is very serviceable, though the result cannot be readily expressed in figures. The elaïdin test depends on the property of olein and oleic acid to yield isomeric bodies of comparatively high melting point under the action of nitrous acid. The reagent may be applied in various ways. Nitrous fumes may be allowed to bubble through the oil; a mixture of dilute sulphuric acid and sodium nitrite may be used; or the oil may be treated with a freshly prepared solution of mercurous nitrate, which has a remarkable power of retaining nitrous acid. The first process I have not personally employed, and the second appears apt to give erratic results. With care the third method gives very constant indications. For the test 12 grams of mercury should be dissolved in 11 c.c. of cold nitric acid of 1·35 specific gravity, and 8 grams of the newly made solution are shaken with 96 grams of the oil, and the agitation repeated every ten minutes during two hours. When treated in this way, olive oil, and other animal and vegetable oils consisting chiefly of olein, give solid elaïdin, while the drying oils remain liquid. Cotton-seed oil and others of the same group give intermediate results. With the exception of bottle-nose or sperm oils the oils from marine animals give little solid elaïdin. The elaïdin reactions of rape and mustard oils have already been described. Olive oil is remarkable for the canary or lemon-yellow colour, and the great firmness of the product, which, after twenty-four hours, is impervious to and sometimes rings when struck with a glass rod, but this peculiarity is common to arachis and lard oils. Of the physical characters of oils, the specific gravity is of the first importance. The solidifying point is not generally capable of accurate observation, and is apt to vary considerably with different samples of the same kind of oil. The absorption spectrum is simply of service in detecting the presence of chlorophyll, and, therefore, by inference, of a vegetable oil; but its indications become less distinct the older an oil is, or the more carefully it has been refined.

The viscosity of an oil is a valuable and highly practical characteristic, but to make the observations of value they must be conducted with more care than is commonly the case. Thus, a sample of rape oil, which will flow out of a tube with a small orifice in three hundred seconds when the temperature is 38° C., will require three hundred and nineteen seconds at a temperature of 37° C. Hence the most scrupulous care is necessary to bring the sample to be tested to the standard temperature, and to keep it at that temperature during the operation.

I have not attempted in this paper to give an account of or even mention all the tests and processes of greater or less value which may be employed for examining oils, but have rather attempted to lay stress on those details of manipulation which have been neglected, and those pecularities of constitution which are likely to prove of practical value in discriminating between different kinds of fixed oils. It must, however, be remembered that a fixed oil is at least only a natural product, varying in character with the age, habitat, and personal idiosyncrasy of the plant or animal which has produced it, and hence is not of absolutely constant composition. Again, oils from different sources, though slightly different in consti-

tution, possess so many properties in common that any proximate separation of the two is out of the question, and the presence of the oil forming the minor part of the mixture is often only a matter of inference from the abnormal physical and chemical characters of the sample. But if chemists can see little hope of detecting in all cases the exact nature of complex mixtures of oils, they are now in a position to indicate with considerable certainty whether a given sample of oil is fitted for its intended purpose, and in this manner may do great service, and relieve the engineer and manufacturer from the crying evils of corrosive lubricating oils, non-drying linseed oils, and objectionable sophistications of all kinds.

In conclusion, I may call your attention to a very ingenious arrangement devised by Soxhlet for extracting oils from seeds, etc., but which is capable of numerous other applications. A flask containing ether or other volatile solvent is heated by means of water contained in an outer vessel of tinned iron or copper. Fitted to the neck of the flask by means of a cork is the Soxhlet tube, which consists of a kind of large test tube furnished with a siphon. The vapour passes into the upper part of this tube by means of the side tube, and thence rises into the Liebig condenser, where it is condensed, and drops upon the sample, which, in my apparatus, is contained in a loose inner test tube, having a hole at the bottom closed by a plug of glass-wool. When the condensed solvent, having the oil in solution, rises sufficiently high, it passes into the siphon, and forthwith runs back into the flask, to be again evaporated, condensed and utilized. When the exhaustion is complete it is only necessary to remove the inner tube, when the apparatus is ready for another extraction.

Reviews.

PROCEEDINGS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION at the Thirtieth Annual Meeting; also the Constitution, By-Laws and Roll of Members. Philadelphia. 1883.

This year the annual volume of the American Pharmaceutical Association came to hand later than customary, but not too late to be welcome. As usual the Report on Pharmacy by Professor Diehl constitutes a large portion of the volume, extending over about 440 octavo pages. We have referred in former years to the nature of the arrangement adopted in these reports as bringing into juxtaposition abstracts referring to kindred subjects, and have only to say now that this plan is well carried out in the present volume. The report is very creditably executed, and although it is more inclusive than the corresponding section in the Conference Year-Book, we see little in it to object to on that ground. One valuable feature, in which it certainly has the advantage of its British contemporary, is the extent to which it is illustrated by means of woodcuts, especially in abstracts where any new apparatus may be described.

An epitome of the papers read at the meeting at Niagara Falls in September last has already been given in this Journal. These papers and the discussions following them are now printed *in extenso* in the volume before us. We do not think that the plan of printing the papers in one section and the discussions in another is at all a convenient one, besides which it probably tends to the ignoring of the latter.

We are frequently applied to for information respecting the laws regulating the practice of pharmacy in the United States and have sometimes felt much difficulty in complying with such a request in consequence of the multiplicity of existing laws, and the constant changes that are still being made. But as is well known the American Pharmaceutical Association appoints every year a Committee on Legislation, whose special duty it is to keep the knowledge of the members *au courant* with the legislative changes affecting their calling in different parts of the Union. The last report states that during the previous year new laws regulating the practice of pharmacy had been enacted and approved in the states of Georgia and Wisconsin, and amendments to previously enacted pharmacy laws had received the sanction of the proper authorities in Connecticut, Iowa and West Virginia. Laws intended to prevent the adulteration of food and drugs had been enacted in Louisiana and Massachusetts, and in Connecticut a new licence law contained a clause referring to the supply of alcoholic liquors for medicinal purposes. In pursuing its inquiries the Committee became acquainted with the fact that there were in operation several laws affecting the practice of pharmacy that had escaped notice in previous years, and extracts from these are now given. The present volume, therefore, contains an unusual amount of information on this subject.

THE CHINESE OPIUM SMOKER. London: S. W. Partridge and Co. 1883.

Hitherto we have carefully abstained from introducing the subject of the opium controversy into these pages, and only refer to it now in order to direct the attention of our readers to a pamphlet bearing the above title on account of its artistic merits. It consists mainly of twelve illustrations, fac similes of Chinese drawings, depicting the downward stages of the opium smoker. It is stated in the preface that the pictures were originally published in the form of cartoons in China, and that in that country they have been posted up in the wayside tea-houses, as well as on the walls of public places, and circulated far and wide among the Chinese people at the expense of native gentlemen who have become alarmed at the spread of opium smoking, or who have wished to store up merit for themselves by circulating tracts and leaflets exhorting men to virtue. About six years ago the Chinese Anti-Opium Society of Canton republished a set of these pictures with a descriptive text, and an English resident in Hankow, thinking that people in this country might be reached by pictures who would not read ordinary anti-opium literature, sent home a set coloured by a native artist. It is from this set that the fac similes have been taken; the pictures have been beautifully executed, and each is accompanied by a translation of the original Chinese description. It is not probable that the sum of sixpence, the price at which the pamphlet is published, represents more than a portion of the cost of bringing it out.

CACAO: HOW TO GROW AND HOW TO CURE IT. By D. MORRIS, M.A., F.G.S. London: S. W. Silver and Co.

This little manual contains the substance of a lecture delivered under the auspices of the Institute of Jamaica by the indefatigable Director of Public Gardens and Plantations in that island, which had for its primary object the diffusion of information respecting the cultivation and preparation of cacoa, with a view to a further development of the industry. After historical and descriptive accounts of the cacao plant, the author deals with the methods of cultivation, the gathering of the crop, and the subsequent sweating and curing of the beans, and he also gives some information valuable to intending planters as to the cost of establishlng a cacao estate and its relation to the average yield of the trees. We learn that a good cacao tree in good soil yields from fifty to several hundred pods per annum; the average for well cultivated trees at seven years old is between eighty and one hundred pods, about eleven pods being required to yield one pound of cured cacao. Certainly the author holds out a tempting inducement to those in a position to take up the cultivation in Jamaica. for he tells them that by combining on the same plantation the cultivation of the cacao and the banana, sufficient profit may be derived from the sale of the banana fruit to cover the entire expenditure during the first four or five years required for the maturation of the cacao plants. The book contains a considerable amount of interesting reading, though many of the details will be of use only to those who can give them practical application.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Cannabin.

Sir,—Dr. Matthew Hay states in the *Pharmaceutical Journal*, No. 675, 1883, that he has discovered in the Indian hemp an alkaloid, to which, from its action, he gives the name of tetano-cannabine.

This gentleman at the same time remarks that he received, some considerable time ago, from Messrs. T. and H. Smith and Co., of Edinburgh, under the name of cannabine, a preparation which was not pure, but which, probably, consisted of a mixture of resin and varying quantities of the active principle of the hemp, while a cannabine supplied to him by me, apparently prepared in a similar manner to that of Messrs. Smith, possessed very little or no narcotic action.

Replying in self-defence to Dr. Hay's remark, I beg to mention that I have in my price-current two entirely different preparations from Cannabis indica, viz., firstly, cannabin, being the ordinary commercial resin from Indian hemp; and secondly, cannabin. tannic. (Merck).

The first cannabin mentioned, and described by Dr. Hay, is a resinous body which, from long custom, still goes under the name of cannabine, but the action of which, as I had long since discovered, is far from being certain or reliable. In consequence, I have made it the study of many years to isolate the active principle of the Indian hemp, a task in which I have, I flatter myself, after very considerable labour and trouble, succeeded.

This is the cannabin. tannic. (Merck) referred to above, and which glucoside has nothing whatever in common with the ordinary resinous cannabin.

A series of experiments, as to the effect of my cannabin. tannic. has been made, and I give here a few extracts from my report on "New Remedies," of February of this year, on the subject.

"*Cannabin. Tannic.* (*Merck*).—The preparation which I introduced under this name is a glucoside contained in Indian hemp, combined with tannin. Endeavours have been repeatedly made to discover and isolate, in a form suitable for medicine, the active principle of this plant, which has long been treasured for its medicinal properties. A cannabin has long been in vogue, which, however, under this name, was really little more than a very pure extract of cannabis indica.

"After numerous experiments, involving much time and trouble, I succeeded in producing this new preparation, which in the very short time of its existence has gained for itself a considerable reputation.

"As already mentioned, this cannabin is of a glucoside nature, and resembles, in its chemical comportment, solanin and allied preparations, in that it shows an alkaloid reaction. The combination with tannin has been chosen in order to give to the glucoside, which is of a nature very liable to decomposition, a handy and durable form.

"The action of cannabin. tannicum is narcotic, viz., soothing and soporific, without any bad after effects, as is often the case after the use of morphia and other opiates. With regard to its practical use, we have an article by Dr. Fronmüller in the *Memorabilien von Betz*, 1882, No. 51, which says:—'The patients to whom this cannabin was administered were afflicted with almost every variety of disease, and were at the same time suffering to a high degree from nervous sleeplessness, for which they had nearly all taken opium or morphia without effect.'

"The dose of cannabin. tannicum varies in different cases from 0·1–1·5 gram, but the most usual was 0·2–0·5 gram, administered, as a rule, at about half-past nine in the evening. Only in the case of very large doses, 1·0 or 1·5 gram (in the case of very delicate individuals, also, naturally, with smaller doses), were appearances of unconsciousness occasionally observed, which, however, quickly disappeared on the use of acetic ether.

"Most important is the fact, that neither were the digestive organs in any way affected, nor retarded motion of the bowels produced, as is generally the result from the use of other opiates.

"Dr. Hiller (Charité Berlin) also referred, at the January meeting of the 'Verein f. i. Medicin,' to my cannabin. tannic, and his observations agreed with those of Dr. Fronmüller. He described it as a mild and agreeable hypnotic, especially in cases where morphia cannot be administered on account of unfavourable after effects of the latter drug on the patient. It also appears that the use of cannabin. tannic. will have a very large and important field in asylums for the insane.

"I am indebted to Dr. Karrer, of the *Kreisirrenanstalt Erlangen*, for various communications, according to which highly satisfactory results were obtained with my cannabin. tannic. in cases of excited and restless lunatics."

In the interest of myself, and also of others, I deem it advisable to give publicity to the above, inasmuch as Dr. Hay does not seem to be acquainted with my cannabin. tannic., to which he does not in any way refer.

Darmstadt. E. Merck.

Purity of Sodium Nitrite.

Sir,—I am sorry that a mistake in the "Month's" abstract of my paper on the "Nitrite of Sodium in Angina Pectoris" has misled Mr. Ekin in his letter to you in the issue of June 9.

The abstract is so far right in stating that a specimen of nitrite of sodium procured from a London firm of acknowledged eminence contained actually only 33 per cent. of the nitrite, the remainder being nitrate. But it is wrong in attributing to me the statement that in another specimen, purchased two years previously, I found only a trace of the nitrite. What I really said was—a trace of the nitrate.

It is due to the London firm alluded to that I should add that a specimen of the nitrite, which they have recently forwarded to me, is as pure as could be expected.

The purity of the nitrite depends much on the process of its manufacture. Employing the proper process it is not difficult to obtain a comparatively pure nitrite. But I confess I am agreeably surprised to observe that, according to Mr. Ekin, nitrite of sodium is "one of the purest salts to be met with in commerce." It may be so when prepared under a guarantee, as for Mr. Ekin, but I fear it is not commonly so pure.

12, *Hope Street, Edinburgh.* Matthew Hay, M.D.

W. J. Williams.—The Secretary to the Institute of Chemistry is Mr. C. E. Groves, Somerset House Terrace, Strand, W.C.

M. C. Summers.—We cannot refer you to a book such as you describe, neither are we acquainted with the work mentioned.

"*Pharm.*"—(1) "Tinct. Ferri Perchlor. ℥j; Bals. Copaib. ℥j; Sp. Æth. Nit. ℥j; P. Cubeb. ℥ss." This mixture presents no difficulty. The ingredients require only to be mixed; no attempt should be made to emulsify with mucilage. (2) "Potass. Permang. ℥j; Syr. Aurant. ℥j; Aq. ad ℥viij." In this case reduction takes place and the mixture gelatinizes.

R. Modlen.—It has already been observed that a mixture containing spirit of nitrous ether and sodium salicylate becomes discoloured more or less; dependent on the condition of the spirit of nitrous ether.

"*Rhei.*"—"Iodoform, Creasote, aa gr. j: fiat pil." One grain of bread crumb to each pill answers very well as an excipient.

"*Provident*" is recommended to communicate his suggestion to the Council of the Chemists' Assistants' Association.

"*Pill Coater.*"—You do not mention the material you wish to use. For a process of coating pills with gelatine, see before, p. 506. A number of other communications on the general subject have been published in this Journal, references to which may be found in the indexes to the different volumes.

Communications, Letters, etc., have been received from Messrs. Gillman, O. Jones, Cowan, Miller, Mumbray, Kinninmont, Crinis, J. D. N.

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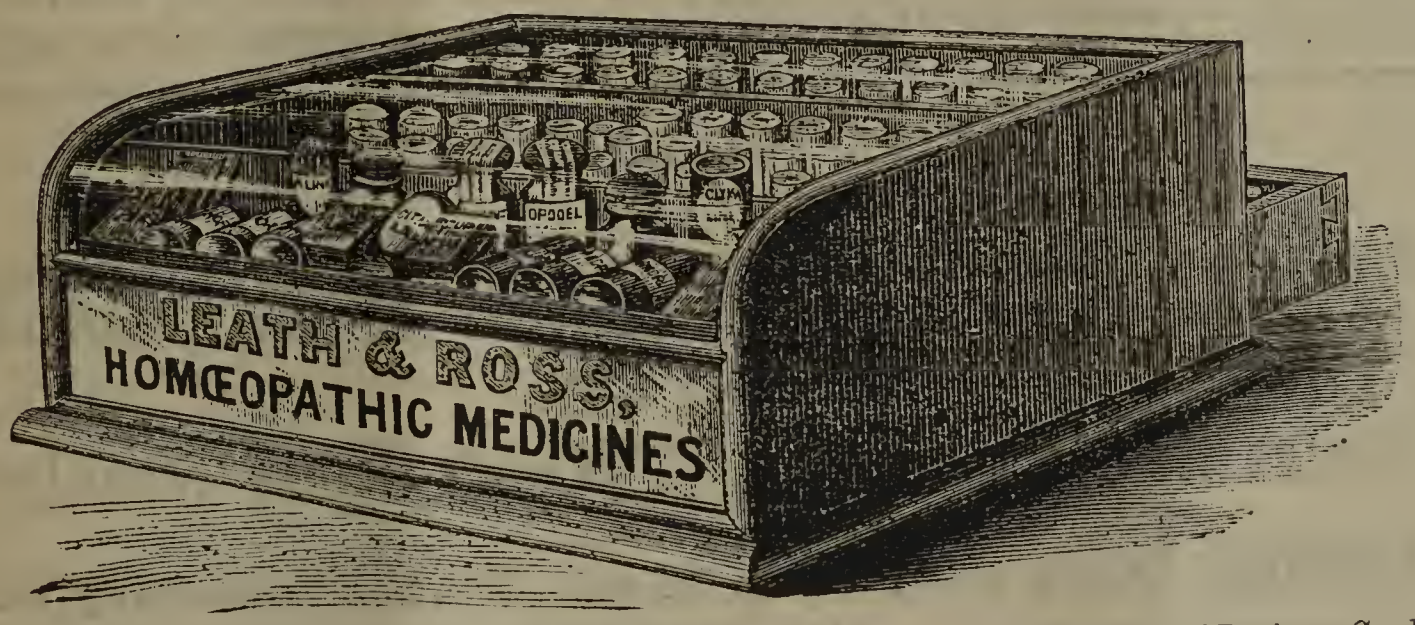

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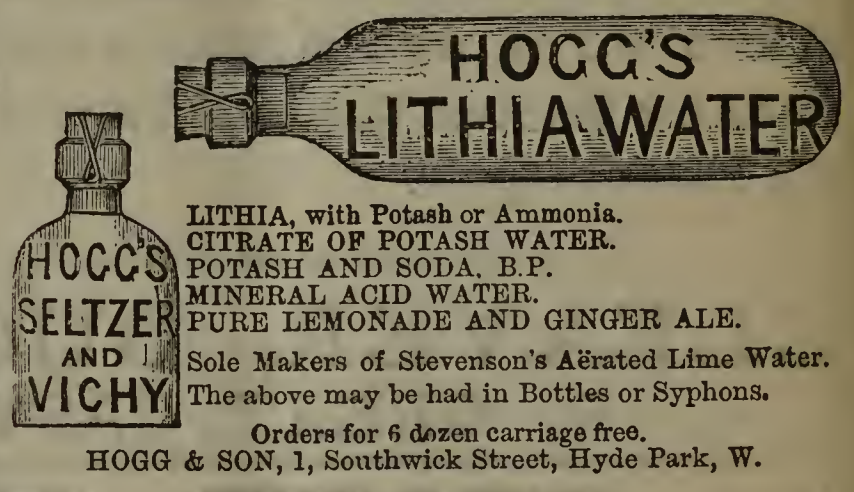

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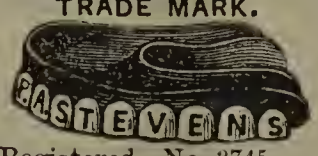

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3 and 4 oz., clear blue tinted, plain or graduated		7s. 6d.
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Name and Address can be had on the flat shape bottles, without any extra charge whatever. Country packages 1s. each. P. O. Orders to be made payable at Tottenham Court Rd. Cheques crossed London & Westminster Bank.

Certain Sudden **DEATH** to all Grubs, Aphis, Lice, Red Spider, Thrip, Mealy Bug, etc.

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A combination of Hydrocarbon Oils made Soluble in Water. **For destroying ALL INSECTS and PARASITES that infest Trees and Plants,** whether at the Roots or on the Foliage. It cures Mildew and Blight on Fruit or Foliage, and a weak solution Kills all Vegetable Grubs, Turnip Fly, &c. Cleans Grapes from Mildew or Mealy Bug without affecting the bloom; and, thickened with a little clay, makes a good winter dressing. Destroys Lice and Fleas on Animals. Sold by Seedsmen and Chemists, 1/6, 2/6, 4/6 a bottle. Per gallon 12/6, or less in larger quantities. Each bottle bears the inventor's Trade Mark (a Cat's Head) and full directions for use. Wholesale: BARCLAY and EDWARDS, London; RAIMES, Edinburgh and York; EVANS, Liverpool; and D. MCLAREN, Edinburgh.—New York: ROLKER & SONS. *Manufacturer*, E. GRIFFITHS HUGHES, Manchester.

THE

CENTRAL SCHOOL OF CHEMISTRY & PHARMACY

Laboratory and School Buildings:

173, MARYLEBONE ROAD, N.W.

The next Session of this School will commence on Monday, September 3, 1883, and the Principals will be glad to have an early intimation from Students who intend joining at that date. The lectures given at this School are delivered in as practical a manner as possible, and specimens are provided for the Students at the Practical Botanical Classes free of cost.

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The newly discovered certain cure for Corns.

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NEW TOOTHACHE REMEDY.—Gives instant ease without injury to the Teeth.

RECIPES for making above, 1/1 each, 3 for 2/6, post free, with full instructions. Send for detailed lists.—BROOKS, Chem., Louth, Lincs.

SAVARS CUBEB CIGARETTES. Cubebs Stramonium and Cannabis Ind, (soothing). Relief in Asthma, Throat Cough, Bronchitis, Influenza. A specific against fogs. Boxes (12) 1s., 9s. per doz.; (36) 2s. 6d., 24s. per doz. Full directions. EVANS, LESCHER & WEBB, London. EVANS, SONS & CO., Liverpool. Samples gratis, post free.

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J. & A. Churchill, 11, New Burlington St.

Those for Assistants Wanted, &c., &c., will be found on page xviii.

THE

WESTMINSTER COLLEGE OF Chemistry & Pharmacy.

The next Session will commence on Monday, September 3rd.

Students desiring to enter the School at the commencement of the Twelfth Session, on 3rd September, should send in their names without delay, as the few remaining benches in the Laboratory are being rapidly filled up. The regular course is three months, but those already possessing knowledge may enter at any time when there is room.

For Fees see Advertisement last week.

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Terms, Four Guineas per Month.

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130, CAMDEN ROAD, N.W.

SIX of my Students presented themselves at the April Minor. **FOUR** passed—all at their first attempt. Those wishing to attend my "practical demonstrations" for the June or July Minor are requested to apply, as my few vacancies are fast filling. **PERSONAL TEACHING. NO DEMONSTRATORS.** Postal Instruction. Enclose stamp for particulars; or "at home" daily from 1.30 to 2.30.

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325, KENNINGTON ROAD, S.E.

Director: Dr. JOHN MUTER, M.A., F.I.C., F.C.S., &c.

FOURTEENTH SESSION, 1883-4.

Entries now being made for the 10th September. Fees, Syllabus, &c., apply to W. BAXTER, Secretary.

PHARMACEUTICAL PRELIMINARY,

LONDON Matriculation, College of Preceptors, Apothecaries' Hall, Glasgow, Edinburgh, and all Medical Preliminaries. Rapid and thorough preparation, privately and in class. Also postal tuition for these examinations and Bell Scholarship. For particulars enclose stamp, Mr. DAWES, 1st B.A. (Lond.), 11, Burton Crescent, London, W.C.

TO Parents, &c.—Vacancy for Pupil (in or out-door). A light and remunerative calling. Highest professional references to class of work instruction would be gained from. Mr. WHITEHOUSE, L.D.S., Dentist, 50, Parliament St., S.W.

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PRELIMINARY.—Arithmetic and Metric System, 1s. How to Write an Essay, 6d. Latin Grammar and Cæsar Simplified, 1s. MINOR.—Equations Simplified, 1s. Illegible Autograph Prescriptions, 1s. Minor Questions, 1s. Notes on Dispensing, 1s. Prescriptions given at the Minor, 1s. For "How to Prepare for either Exam.," enclose stamped envelope, CHEMIST, care of Mr. J. Edwards, Wye, Kent. Herbarium of Plants, 6s.

ENGAGEMENTS WANTED.

BY a German. As ASSISTANT. Highly recommended. Age 25. Height 5ft. 10in. Speaking English and French. Can assist in Surgery. H. POTHS, 4, Sugarloaf Ct., Leadenhall St.

TEMPORARY MANAGER. Long experience. Disengaged for a few weeks. High-class references. A. B., 2, Joliffe St., Princes Rd., Liverpool.

AS TRAVELLER, or position of trust in the Wholesale. 13 years' experience; several as Manager. Age 28. Unexceptionable references. EVANS, 25, Canonbury Villas, Islington, London.

AS MANAGER, or Town or Country TRAVELLER. 10 years' West-end experience. D. C., 67, Great Portland St., W.

WHOLESALE.—Wet and Dry, despatch of orders, &c. Slight knowledge of Retail. At liberty July 7th. Good references. Aged 23. Teetotaller. WM. PEARSON, 101, Eastgate St., Chester.

ADVERTISER, age 27, with the highest references, desires a temporary engagement until September. 13 years' first-class and varied experience. L. S., 149, Marylebone Rd., London, N.W.

AS ASSISTANT. Age 25. Nearly 10 years' experience. In or out-door. Excellent references. T. J., 17, High St., Horncastle.

OUT-DOOR. As JUNIOR. 6 years' experience. Age 22. State hours. A. HEYWORTH, 22, Southgate, Halifax.

SEASIDE.—Pharmacist who has sold his business, wishes engagement for the season. Out-door preferred. First-class experience. X. J., Naylor, Pike & Co., 9, Fenchurch Avenue, E.C.

TEMPORARY ASSISTANT or MANAGER. Age 30. Disengaged. First-class references. Town or country. W. B., Arfleet, Corfe Castle, Wareham.

AS ASSISTANT. Where time for study will be given in lieu of salary. Within easy distance of Wills' College preferred. 7 years' experience. Satisfactory references. Height 5ft. 10½in. Age 21. Disengaged about middle of July. STUDENT, Mr. Edmunds, Chemist, Newport, Mon.

AS Surgeon's DISPENSER, and to help keep the books if required. Age nearly 17. 2½ years' good experience. Good references. In house, and small salary expected. Photo. H. FOWLER, 7, Salem St., Barnstaple.

EVENING engagement by a Minor, on Saturdays. Good Dispenser and Prescriber. London experience. Ætat 25. A. P. S., 27, Pratt St., Lambeth Rd., S.E.

AS LOCUM TENENS. By a qualified gentlemanly business man of long experience and good address. Most satisfactory references. Disengaged after the 26th. ALPHA, 2, Westbourne Park, Bayswater.

PARTIAL employment with Medical Man or Chemist. Good Dispenser. Knowledge of Retail. 4 years' experience. Age 21. Abstainer. A. B., 98, High St., Putney, S.W.

EVENING employment by gentleman occupied during earlier part of day. Moderate salary. B., 8, Duchess St., Portland Pl., W.

ENGAGEMENTS WANTED.

ASSISTANT. In last situation for nearly 7 years. Good Counterman. Well up in Dispensing. Single. Abstainer. Age 24. Photo., &c., on application. J.E.C., The Hollies, Litherland Park, Seaforth, Liverpool.

AS DISPENSER. Age 23. 8 years' experience. Salary moderate. O., care of Mr. Heard, 199, Upper Kennington Lane.

BRANCH MANAGER, or out-door engagement. Thoroughly experienced. Good references. Age 38. Disengaged. S. M. C., 4, London Rd., High Wycombe.

CHEMISTS' LOCUM TENENS and TEMPORARY. Apply to R. E. BUNN (of Woolwich and Ipswich) for all particulars. Numerous references (London and country) or testimonials. 9, Friar's Rd., Ipswich.

FIRST of July.—As ASSISTANT or MANAGER. 10 years' experience. Would take temporary duty. Extract Teeth. Minor qualification. Age 26. M.A., 13, Harrow Rd., Queen's Park, W.

AS DISPENSER to Surgeon or Chemist. Age 21. Height 5ft. 9in. Highest references. P., 349, City Rd., Islington, London.

AS DISPENSER and COLLECTOR to a Doctor or Institution. Good references. Many years' experience. Salary moderate. Age 30. Married. Registered Dentist. C. J. W., 322, York Rd., King's Cross, N.

AS MANAGER of Branch. 11 years' varied experience and first-class references. Married. Age 26. A. ALTHORP, 169, Oxford St., Stepney, London, E.

IMMEDIATELY.—As JUNIOR or IMPROVER in select Retail and Dispensing business. 4 years' experience. Age 23. Height 5ft. 8in. Salary moderate. B. MIDDLETON, 78, Park St., Derby.

AS JUNIOR. 5 years' experience. Age 21. London preferred. C. G. D., 105, Regent's Park Rd., N.W.

TEMPORARY. Ætat. 31. By day, week, or month. Town or country. Thoroughly experienced in all branches. Terms very moderate. Irreproachable references. Disengaged. A. WOOD, 4, Woodfield Cres., W.

ASSISTANTS WANTED.

APPRENTICE.—W. W. CLARK, Pharmaceutical and Family Chemist, Dorking, has a vacancy for a well educated gentlemanly youth as an APPRENTICE. A comfortable home and every opportunity for acquiring a thorough knowledge of the business. Particulars on application.

AN ASSISTANT for a light Retail and Dispensing business. About 22 years of age. Churchman preferred. An accurate Dispenser. State height and salary required to M., care of Messrs. Hodgkinson, 198, Upper Whitecross St., London.

IN a Family and Dispensing business, an out-door ASSISTANT. State age, height, references, whether married or single, qualification and when at liberty, to G. R., care of Meggeson & Co., 14, Miles Lane, London.

AT once.—An ASSISTANT. Unmarried. One desiring permanent engagement. To Manage a Mixed business for a widow. Must be able to Extract Teeth and Prescribe. Apply, with reference, stating age, height, salary, to W. ROCLIFF, 65, Cottenham St., C.-on-M., Manchester.

IMMEDIATELY.—IMPROVER or Junior ASSISTANT. Accustomed to ordinary country trade. Time for study. Apply, stating references, salary, age, &c., to C. GERRING, Chemist, Witney, Oxon.

A MAN, having thorough experience in a Drug Warehouse. Must have good references. Apply by letter, with full particulars, to THOS. KEATING, 1, London House Yard, E.C.

ASSISTANTS WANTED.

TO Dispensers.—An Assistant DISPENSER for the St. George's and St. James's Dispensary. To attend daily from 11 o'clock a.m. to 2 p.m., or until the dispensing is finished. Applicants for the appointment are requested to send their letters of application and testimonials to the SECRETARY, at the Dispensary, 60, King St., Golden Sq., W., not later than the 19th of June instant, and to attend personally at the Dispensary on Thursday, the 21st of June instant, at 4.30 o'clock p.m. Salary £2 10s. per calendar month.

AT once.—A GENERAL MANAGER in a Wholesale Drug business, where a large Mixed trade is carried on in Drugs, Patent Medicines, Sundries, and Drysalteries. A gentleman experienced in these branches of trade, quick, energetic, and capable of controlling the staff working under him, would be liberally dealt with, and find a permanent situation. Address, ALPHA, care of Messrs. Cleaver & Sons, 32, Red Lion St., Holborn, London.

A JUNIOR ASSISTANT. In-doors. A Wesleyan preferred. Good references indispensable. Apply, Mr. TREZISE, Chemist, Wellingboro'.

A TRUSTWORTHY Junior ASSISTANT. Out-doors. Must be able to Prescribe, also accustomed to Mixed business. Apply, stating age, terms, and when disengaged, to EDWARD MACHON, 25, Park St., Derby.

MR. WOODCOCK, Birkenhead, is in immediate want of an ASSISTANT. Out-door. Age about 22. Send full particulars, carte de visite, and salary required.

R. JEFFREY & SON, Cheltenham, will require a good all-round ASSISTANT towards the end of June. One only kept. An abstainer preferred. Passed man not essential. Applicants please state usual particulars.

JUNIOR.—Immediately. A reliable young man as Junior ASSISTANT, or an IMPROVER. Also an educated youth as APPRENTICE. Abstainers preferred. Mr. PROCTER, Chemist, Penarth, Glamorganshire. Penarth is a rising watering place, and one of the healthiest places in the kingdom.

AN ASSISTANT, where two are kept. Minor qualification. He must be a quick and careful Dispenser, and accustomed to a good class of business. Apply, stating usual particulars as to age, salary required and references, to H. J. CHURCH, Pharm. Chemist, Cambridge. An assistant requiring a permanency preferred.

FIRST-CLASS out-door ASSISTANT, for about three months. Enclose carte, and state usual particulars, with references. COMPTON & SON, Margate.

A JUNIOR ASSISTANT. Accustomed to good Dispensing. Apply, enclosing carte and salary required, to CHAS. A. SMITH, Ventnor, I.W.

G. T. W. NEWSHOLME, Pharmaceutical Chemist, Sheffield, requires an ASSISTANT (registered) to Manage a Branch. One who has been accustomed to a Mixed trade preferred. State age, height, salary required, &c.

AN ASSISTANT, used to a good country trade. Must be well recommended by previous employer. Age 22 to 25. Enclose carte (to be returned). State salary and full particulars. Apply D. PROSSER, Sheerness.

AN ASSISTANT. Age about 19. One accustomed to country trade preferred. Out-door. No Sunday duty. Apply, stating salary required, references, when disengaged, and previous engagements, to J. HOWARD, Market Pl., Ely.

DR. SARGENT, Dorrell Pl., Brixton Railway Station, London, requires an ASSISTANT to Dispense, attend Chemists' Retail and Extract Teeth. Apply, stating salary (in addition to board, lodging and washing), age, height, references and carte (will be returned). Permanency preferred. 8 a.m. to 9 p.m. Sundays 6 p.m. to 9 p.m. Holiday every month.

ASSISTANTS WANTED.

A SENIOR Assistant, of good experience. Age preferred from 26 to 30. Apply personally to Messrs. J. Robbins & Co., 147, Oxford St., W.

IMMEDIATELY, or as quickly as convenient, a competent and reliable Assistant. A gentleman desiring a permanency, liberal terms and a comfortable home will be tendered. Also a Junior who requires time for study (afternoons 2 to 5). Apply personally, or with particulars, enclosing carte, to Mr. Bolton, Bristow & Co., 5, Bishopgate Avenue, E.C.

IMMEDIATELY, or in a few weeks, a Senior. Outdoors. To a good man a permanent situation. Close every night at 8, excepting Tuesdays and Saturdays. Send particulars respecting age, height, salary, experience, if married or single, also carte (which will be returned), to Harry Grove, 11, Park St., Walsall.

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A MANAGER for a Dispensing and Prescribing business, W. Good Dispenser and Counterman. Unexceptionable references required as to steadiness and ability. Salary, 30s. per week and commission, with unfurnished apartments. Apply to W. Gristwood, Jun., Messrs. Newbery & Son, 1, King Edward St., E.C.

A MARRIED Assistant. Thoroughly competent. To reside in the business house. Rent, rates and gas free, and £80 yearly, rising by £10 to £100. Enclose carte if possible. Letters unanswered in three days declined. Hours 8.30 to 8.30. No Sunday duty. Philip H. Mason, Pharmaceutical Chemist, Gosport.

AN Assistant. About 22 years of age. Tall and of good address. Preference given to one who has been apprenticed in a first-class provincial business. Apply, stating full particulars and salary required, in first application, and enclose carte (which will be returned), to D., 14, Highbury Park, London.

FOR a period of about three or four months.—An experienced and trustworthy Junior Assistant. Of good address, and competent to take charge during absence of principal. Apply, stating age, height, salary required, and references, to W. Dodds, 10, Hessle Rd., Hull.

IMMEDIATELY.—In-door. A competent Assistant. Minor qualification. One seeking a permanency desired. Must be gentlemanly and of neat and quiet habits. One other assistant employed. Apply personally, or with full particulars, to T. R. Prime, Chemist, Upper Norwood.

MESSRS. J. C. & A. THRESH, Buxton, have a vacancy for a Junior or Improver. A young man who has served part of his time would be treated with. In reply, state height, references, and other particulars, and enclose carte de visite if convenient. Say when disengaged.

DISPENSER.—For the Public Dispensary, 59, Stanhope St., Clare Market, an efficient Dispenser. He must be between 20 and 40 years of age, and a member of the Pharmaceutical Society of Great Britain, or possess the qualification (of Dispenser) of the Apothecaries' Company. Hours from 12 to 2.30 and from 4 to 6 daily (Sundays excepted). Salary £5 per month. Applications, accompanied with testimonials, to be made in writing and sent to the Secretary, at his offices, 5, Bishop's Court, Lincoln's Inn, not later than Monday, the 25th June, and candidates must be in attendance at the Dispensary House, 59, Stanhope St., Clare Market, at 3.30 o'clock precisely on Tuesday, the 10th July, when the election takes place. John Phillips, Secretary.

5, Bishop's Court, Lincoln's Inn,
12th June, 1883.

ASSISTANTS WANTED.

AN Assistant, in a provincial town, with Major or Minor qualification. Several other assistants are kept and the hours are light. Address, stating salary required, with references, to A. B. C., care of W. Edwards & Son, Queen Victoria St., E.C.

A GOOD Junior. Accustomed to Dispensing and light Retail. Apply, with carte and particulars of experience, to J. Smithson, 1, Preston Rd., Brighton.

COMPETENT Assistant. Not under 22. Apply, giving full particulars respecting age, qualifications, length and character of experience, names and addresses of last two employers (at least), and salary expected, to Clay & Abraham, Liverpool.

A JUNIOR. He must be a neat and accurate Dispenser, of civil and obliging manners. Apply, stating age, height, salary, with reference, to John Ing, Chemist, High St., Aldeburgh-on-Sea, Suffolk.

AS Junior or Improver, in a very healthy suburb of London. One who requires time for study would find this an excellent opportunity, also a comfortable home. Apply, personally if possible, or by letter, to F. L., 383, Kentish Town Rd., N.W.

AN Assistant. About 21 years of age. In a Retail and Dispensing business. One accustomed to a country trade. Hours of business light, and no Sunday duty. Apply by letter, to S. S., Messrs. Barron & Harvey, Giltspur St., London.

APPRENTICESHIP vacancy.—W. Baxter (late Dowman), 160, High St., Southampton, has a vacancy for a well educated youth as an Apprentice.

AN Assistant. About 25. Competent to Manage a medium class Retail business. Salary £50. Address, with particulars, references, and when at liberty, to J. Woodcock, Chemist, 75, Shaw St., Liverpool.

IMMEDIATELY.—A Junior. About 22 years of age. A good Dispenser. Unexceptionable references required. An apprentice kept. Apply, with full particulars, to J. H. Toone, 82, Granby St., Leicester.

ASSISTANT. Of good address and experience. About 23 years of age. For high-class business, where three are employed. Apply to W. Malden & Co., 195, Brompton Rd., London, S.W.

AN Assistant for a good-class Dispensing and Retail business. About 22 years of age. Apply, stating age, height, and salary required, with previous experience (enclosing carte, which will be returned), to Mr. Bullen, 36, Church Rd., West Brighton, Sussex.

A COMPETENT Senior Assistant. Able to take the Management during the occasional absence of the proprietor. Address, S. J. Weston, Pharmaceutical Chemist, 151, Westbourne Ter., W.

A GOOD Junior Assistant in a large Dispensing business. Five others employed. Apply to Wm. Thomas, 103, Talbot Rd., Bayswater, W.

IN-DOOR Assistant, with Minor qualification. Accustomed to good class trade and Dispensing. Apply, with usual particulars and reference, to Jno. Hallaway, Carlisle.

IMMEDIATELY.—A good Junior, not under 21. Well up in Dispensing and light Retail. Must be of good address. Exceptional references required. Salary £40. Apply personally, or by letter, enclosing carte, stating age and height, to W. B. Trick, 92, Green Lanes, London, N.

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A CHEMIST'S Shop. Neatly fitted. Situated on the Banks of the Mersey. Splendid view from the house. Established as a Branch 9 years. Returning £450 a year. Apply for terms to Thomas Matthews, 39, Oriel Rd., Bootle.

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The Pharmaceutical Journal AND Transactions.

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Pharmaceutical Society of Great Britain,

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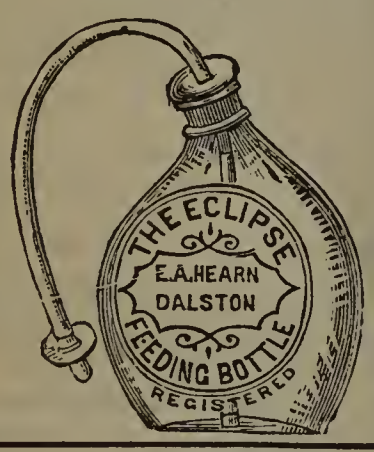

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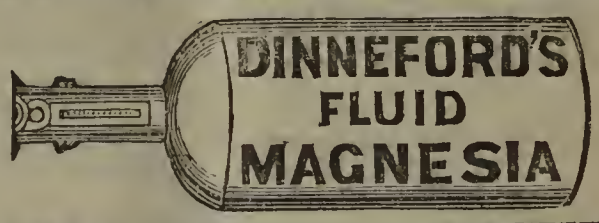

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"Quinquinine contains all the alkaloids of the Officinal Cinchona Barks, closely resembles Sulphate of Quinine, and will prove a serviceable remedy."—*Practitioner.*

"We have found it to be a very good substitute for Quinine, and as it can be produced at half the present price of Quinine, will commend itself to the general practitioner."—*London Medical Record.*

"Sandwich, Kent.—Therapeutically Mackeys' Quinquinine equals Sulphate of Quinine. It is a certain tonic in direct debility, and a sheet-anchor in all cases where fever remits or intermits. Personally I have derived most marked and rapid relief from its use, in repeated attacks of lumbago, to which I am very subject. I take two grains every four hours, dissolved by the aid of Citric Acid, a combination I can recommend.—Thos. Horne, L.R.C.P., &c."

"Birmingham, 18th April, 1881.—Mackeys' Quinquinine is a good tonic and agrees with the stomach better than the old Sulphate of Quinine.—J. Postgate, F.R.C.S."

"Pskow, le 17 Aôut, 1880.—Monsieur,—Je dois vous exprimer ma haute réconnaissance pour l'envoi de votre 'Quinquinine.' J'ai fait des grands essais et je puis temoigner devant tout le monde que votre Quinquinine est plus actif que même Sulfate de Quinine. Des grande doses et pendent plus ou moins longtemps ne font pas des hallucinations comme Sulfate de Quinine. Les fièvres intermittentes se guerissent avec Quinquinine pendant une semaine tout à fait.—N. N. de Froloff & Co. Assistant: V. Tann. Profeseur de Chimie and Pharmacie."

Mr. F. Oldfield writes from Bloemfontéin, S. Africa.—"Please send me Mackeys' Quinquinine, it suits here better than Quinine."

MACKEYS' PURE EXTRACT OF MALT.—Prepared *in vacuo* from the finest Malted Barley. Contains the digestive (diastase) and nutritive properties of Malt unimpaired, in the highest degree of concentration.

MACKEYS' NEW PREPARATIONS OF CERIUM (Protected by Royal Letters Patent).—Cerium has been much used, with marked advantage, in Chronic Intestinal Eruption; in irritable Dyspepsia, attended with Gastrodynia, Pyrosis, and Chronic Vomiting. In Chorea, Epilepsy, and other allied convulsive diseases, in which the Nitrate of Silver has been frequently employed, Cerium possesses the advantage over the Nitrate of Silver, that it may be persevered in without any fear of discolouring the skin. The Ammonio-Citrate of Cerium has lately obtained great reputation as a remedy in obstinate Vomiting, especially in the Vomiting of Pregnancy.—*Vide* "Progress of Therapeutics," *Medical Times and Gazette.*

Mackey, Mackey & Co. supply the following preparations of Cerium:—(By Royal Letters Patent.)—LIQ. CERII, Sedative-Tonic. LIQ. CERII CUM PEPSINA, Tonic-Digestive. MISTURA CERII COMP., Tonic, Stomachic, and Anti-Dyspeptic.

"Birmingham, 18th April, 1881.—The Mist. Cerii Co. is very valuable where there is a tendency to vomiting. I prescribed it in the case of a lady who had aborted every year for six years from the vomiting of pregnancy, with complete success; the vomiting was checked, and she is now near her confinement.—J. Postgate, F.R.C.S."

"Peckham, 7th September, 1880.—I have much pleasure in bearing testimony to the efficacy of your preparation, the Mistura Cerii Co. I have used it both in public and private practice; it is particularly successful in all cases of irritable stomach, dyspepsia, &c., and I have found it allay vomiting (no matter the cause) when all other remedies have failed. Therefore I can, from my own experience, strongly recommend its use to the profession. —I beg to remain, yours very truly, Richard T. W. Smith, F.R.C.S., &c."

"Folkestone, 11th April.—I have much pleasure in testifying to the merits of your Mist. Cerii Comp., and have found it of great benefit in the vomiting in pregnancy, and also in sickness arising from atonic dyspepsia. It also has a very marked influence in cases of pyrosis.—C. Perry, M.D."

"Wandsworth, 18th December, 1881.—I have much pleasure in testifying that I have tried your Mistura Cerii Co. in obstinate cases of vomiting in pregnancy with the most marked success. It is certainly a most valuable preparation.—C. D. Sherrard, L.S.A."

"Withington, 27th October, 1881.—I have administered your Mistura Cerii Co. in cases of most obstinate vomiting, and found it most efficacious.—Jon. Wilson, F.R.C.S."

"Southgate, 3rd Sept. 1880.—I am much pleased with the action of your Mistura Cerii Co.—J. L. Whitmarsh, L.R.C.P."

MACKEYS' MIST. BISMUTHI COMP.—Tonic-Digestive. Dose 15 to 30 minims. The only reliable preparation of Bismuth. Contains Bismuth in its most effective form, combined with Chloroform, Nux Vomica, Hydrocyanic Acid, with or without Morphia. A valuable remedy for various forms of indigestion, and any disorder of the stomach, in pyrosis and other internal malignant diseases. It is prescribed with success for infantile diarrhœa.

"Mackeys' Mistura Bismuthi Co. is an improvement on other preparations of Bismuth, and is more acceptable to the stomach. I have found it a very valuable preparation.—J. Postgate, F.R.C.S., Birmingham, 18th April, 1881."

"I have found the Mistura Bismuth Comp. prepared by Messrs. Mackey, Mackey & Co. most efficacious, and far superior to any other preparation of Bismuth, it not having the tendency to produce constipation that other preparations of the same drug have.—Faithfully yours, C. Eaton Baker, M.R.C.S., &c., The Cedars, Tenterden, 15th July, 1880."

Samples and List forwarded on application.

CAUTION.—The large demand for our specialities has caused systematic imitations. Messrs. Mackey are the inventors and sole makers of Mackeys' Genuine Quinquinine and Mistura Bismuthi Comp., and any imitation is illegal and calculated to mislead the purchaser. The trade is earnestly requested, if not ordering direct, to give special prominence to the word MACKEYS', *e.g.*, Mackeys' Quinquinine; Mackeys' Mist. Bismuthi Co.; Mackeys' Chlorodyne, all soluble Compounds of Cerium, and improved preparations of the Hypophosphites.

MACKEY, MACKEY & Co., Wholesale and Export Druggists and Manufg. Chemists, 1 and 2, Bouverie St., London, E.C.

WHOLESALE AGENTS.—Sang & Barker, Barony Street, Edinburgh; Glasgow Apothecaries' Co., 32 and 34, Virginia Street, Glasgow; W. Hayes & Co., Grafton Street, Dublin; Goodall, Backhouse & Co., Whitehorse Street, Leeds; Evans, Gadd & Co., Exeter; Chas. Cubitt, Market Place, Norwich; Mottershead & Co., 7, Exchange Street, Manchester; J. Todd, Carlisle; J. Young, 16, Market Place, Penzance, &c.

THE ANALYSIS OF SOME AUTHENTIC SPECIMENS OF NUX VOMICA.

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The specimens of the seeds of *Strychnos Nux-vomica* which form the subject of the present communication came into our possession through the kind interest of Professor Bentley,* who had already† laid stress upon the desirability of a chemical examination of the seeds from different districts being made. During the discussion of our paper upon "The Assay of Nux Vomica," at a meeting of the Pharmaceutical Society in February last, Professor Bentley again alluded to the matter, when we promised to make a chemical examination of such authentic specimens as could be obtained (*Pharm. Journ.*, [3], xiii., 677). The seeds of nux vomica appear to come into the English market under three heads: "Bombay," "Cochin" and "Madras." Of these the "Bombay" is the most highly prized by manufacturers. No analysis of these seeds has been published, and in fact, so far as we can find, there is no analysis upon record of an authentic specimen of this important drug. Two series of specimens are in our possession, the one collected in 1877, the other in the present year. The first series were labelled "Bombay Fine," "Bombay Ordinary," "Cochin," "Madras." The second series, "Bombay," "Cochin," "Madras." The seeds labelled "Bombay Fine" had evidently been assorted from "Bombay Ordinary," the selection being apparently based upon the acute edge and satiny texture. The appended table embodies the principal physical characters of the specimens. One of us has spent some time in endeavouring to identify the source or sources of the above specimens, but with little success. The authentic specimens of the entire plant in this country are so scant, often mutilated, and so seldom accompanied by the seeds, that no certain conclusion could be arrived at from their examination. It is unnecessary to enter into a description of the specimens of the plant in this country. The description of the following specimens in the Kew Herbarium may be taken as representative, and are worthy of record:—

Strychnos Nux-vomica—
Large tree, grows from 25 to 40 feet. Larger trees, excepting shoots at base, seem thornless. Smaller, thorny in parts.
On the Kala Nuddi. Dr. Ritchie, December, 1852.
Description by W. R. D.
Leaves: veins, five. Three veins very marked, two indistinct.
[Largest leaf: *breadth*, maxim. 66·54 mm.; *length* from apex to stalk, 127 mm. *Apex*, acuminate, distinct.]
[Smallest leaf: *breadth*, maxim. 57·15 mm.; *length* from apex to stalk, 69·8 mm. *Apex*, indistinct.]
Seeds: concavo-convex, rounded at edge; breadth, maxim. 25·4 mm.

Strychnos Nux-vomica—
From the Herbarium of the late East India Company. Grown at Birmah.
Description by W. R. D.
Leaves: veins, five. Three veins very marked, two indistinct, but more distinct than in K. N.
[Largest leaf: *breadth*, maxim. 10·79 m.m.; *length* from apex to stalk, 69·8 mm. inch.]
Seeds: edges acute, seed very fleshy in centre; *breadth*, maxim. 19·05 mm., *length*, 22·09 mm.

In connection with the physical characters of the seeds, two points should be noticed. Pereira ('Materia Medica,' vol. 2, pt. 1, p. 635), states that the seeds of commerce are scarcely one inch (25·4 mm) in diameter, and also Flückiger and Hanbury ('Pharmacographia,' p. 385). Bentley and Trimen (Med. Pl., 178) state that they are about one inch, averaging seven-eighths of an inch (22·09 mm.): compare the plate of the nux-vomica plant in this work. Many of the seeds at present described have a diameter of 1·1 inch (28 mm.) and average 0·9 inch (23 mm.). The specimens in the Kew Herbarium much more nearly coincide with the descriptions of the authorities above cited.

Again, Pereira ('Materia Medica,' vol. ii., pt. 1, p. 636) describes the cotyledons as "triple ribbed;" but it will be observed that in all the seeds now examined the cotyledons are seven-veined, although in some specimens the two lateral veins are indistinct. Flückiger and Hanbury ('Pharmacographia,' p. 385) state that the cotyledons are from five to seven-veined.

We hope, before long, to obtain some information which will lead to the identification of the plants yielding the seeds which enter the British market and thus to settle the question whether the various seeds originate from different species of the plant.

Method of Analysis.—A difficulty was encountered at the outset when it was attempted to obtain the seeds in a fine state of division. The extreme toughness of the seeds is well known, and upon the small scale, unless special appliances are at hand, a very laborious process is involved in obtaining them as a fine powder by direct pulverization. The method commonly recommended for this purpose, for instance, by the British Pharmacopœia, is to expose the seeds to a process of steaming, and subsequently to dry before powdering. This method answers well as far as the attainment of a fine powder is concerned, but in the present instance was obviously open to objection, for during the steaming condensation of water upon the seeds inevitably occurs, and as boiling water was found to extract no inconsiderable amount of alkaloid it was evident that some other method must be resorted to. The method which we finally adopted was to dry the previously split seeds at a temperature not exceeding 100° C. for three hours and then to reduce to powder in a drug mill. The seeds were found to lose from 10 to 11 per cent. of water when dried at 100° C., and the seeds thus dried very rapidly reabsorbed this amount of water upon exposure to the air. In this way we had no difficulty in obtaining the seeds in a fit state for analysis. Exposure at temperatures from 120° C. to 150° C. was found to effect a decomposition in the constituents of the seeds and thus to complicate matters at a subsequent stage; yet an examination of commercially ground specimens has shown that this procedure is far from uncommon. Some care has to be observed in grinding the seeds, in order that the specimen taken for analysis may be uniform and representative. In grinding, the greater part of the outer

* The seeds were collected in the drug market by Mr. William Hodgkinson, of the firm of Hodgkinson, Stead and Treacher, to whose genuine concern in this matter we are much indebted.

† Bentley and Trimen, 'Medicinal Plants,' 178.

coating of the seeds comes through in the form of light fluffy particles which aggregate together, and if care be not taken these will become separated from the more dense albuminous portions which subsequently comes through the mill. The specimens having been prepared for analysis in the manner above described, the amount of total alkaloid (strychnine and brucine) was estimated by the process proposed by us in a previous paper (*Pharm. Journ.*, [3], xiii., 665). This process consists in the extraction of the alkaloidal salts direct from the seeds by chloroform containing 25 per cent. by volume of alcohol, the extraction of the alkaloids as acid sulphates from this solvent by agitation with dilute sulphuric acid, and finally, the extraction of the alkaloids from the acid solution with chloroform after the addition of excess of ammonium hydrate.

It has been noted above that the powdered nux vomica of commerce has frequently been dried at a temperature exceeding 100° C., with the consequent alteration of certain constituents of the seeds. When this is the case it will be found that the chloroform-alcohol percolate is dark in colour, and often the final alkaloidal residue is brown. Before the cause of this abnormality had been discovered, we had made some experiments with the view of purifying the original percolate. It was found that this could be very effectively done by agitation with a solution of sodium carbonate containing 5 per cent. of the crystalline salt, the dark colour of the chloroform-alcohol percolate being by this means entirely removed. In ordinary cases the colouring matter dissolved by the solvent is retained by the ammonia in the final treatment, but when the seeds have been dried at a high temperature some of the colouring matter is not thus retained, but is dissolved with the alkaloid by the chloroform. It is true that the amount of this impurity in the alkaloidal residue is not very appreciable, as is shown by the following experiments, and when approximate results only are required the preliminary treatment with sodium carbonate may be omitted. In other cases, where strict accuracy is required, it should be adopted when the percolate exceeds dark yellow in colour. Again, in the manufacture of the alkaloidal salts by this process treatment with sodium carbonate is advantageously employed, for the removal of this colouring matter together with the alcohol greatly facilitates subsequent crystallization.

The following results from highly dried seeds show the influence of sodium carbonate as a purifying agent: (α) the percentage of alkaloid obtained normally, (β) the percentage of alkaloid found after treatment with sodium carbonate.

	α.	β.
1.	2·75	2·62
2.	3·32	3·20
3.	2·45	2·36

The solution of sodium carbonate was also used in the analysis of normally dried seeds (100° C.). The experiments show that its use in such cases is unnecessary—

	α.	β.
1.	3·16	3·12
2.	3·48	3·45
3.	3·12	3·18
4.	3·61	3·55

We have previously noticed (paper above cited) that the method of ascertaining the purity of the final alkaloidal residue by precipitation with tannin is not altogether satisfactory, for we found that tannin was incapable of entirely precipitating the alkaloids from even slightly acid solutions. We have since made a great number of experiments on this point. In the first place we find that with the hydrates or carbonates of ammonium, sodium, and potassium, even when added until the solution is only faintly alkaline, it is impossible to precipitate the whole of the alkaloids from solution; this is especially the case with brucine. With reference to other precipitants, none of those employed by us are applicable in acid solution, and the experiments included platinum chloride, potassium mercuric iodide, potassium bismuth iodide, phospho-tungstic acid, phospho-molybdic acid, tannin, picric acid, and potassium chromate. Most of the experiments were quantitative, and showed errors far beyond the limits of the experimental equation. Fairly satisfactory results were obtained with platinum chloride in neutral solutions, and still better with tannin made faintly alkaline with ammonia. The alkaloidal residue to be tested was dissolved in dilute sulphuric acid, the solution made exactly neutral with ammonia, precipitated with excess of the ammonia-tannin solution, the precipitate washed with the same solution, then dissolved by a saturated solution of sodium carbonate, and the alkaloid extracted with chloroform from this solution. This process answers well, although, owing to the large field for experimental error, the process did not give exactly coincident results, even when the pure alkaloids were employed, yet when carefully performed the results are always sufficiently near to pronounce upon the purity of an alkaloidal residue. The following table exhibits some typical results obtained from the residues obtained in the course of analysis: (α) percentage of alkaloid normally found, (β) percentage found after the treatment of the residue with ammonia-tannin:—

	α.	β.
1.	1·68	1·66
2.	2·64	2·57
3.	3·04	2·94
4.	3·90	3·84

The amount of residue used in the above experiments varied from 0 10 to 0·15 gram, that is to say, it was obtained from 5 grams of nux vomica, and to this quantity we were restricted by the great ease with which the alkaloids were decomposed when exposed in a solid state for any considerable length of time at 100° C. We attempted to ascertain by the tannin process the purity of a comparatively large quantity of the alkaloidal residue weighing about 1·0 gram, this being extracted from 30 grams of nux vomica. This quantity gradually lost weight during six hours when exposed on the water-bath, and at the end of this time was dark brown in colour and did not wholly dissolve in dilute sulphuric acid. The same quantity of the pure alkaloids behaved in a precisely similar manner. A further result of this decomposition is the preclusion of the use in analysis of more than 5 grams of nux vomica; for this quantity yields a residue which requires one hour for complete drying, and after this time begins gradually to decompose, consequently the length of time necessary for complete desiccation, in cases where a larger amount of residue than this is obtained would involve the decomposition of the alkaloids in the manner we have just described.

In view of the results described above the fol-

lowing method was adopted for the analysis of the seeds: Five grams of the finely divided seeds, after drying at 100° C., were exhausted with 40 c.c. of chloroform containing 25 per cent. by volume of alcohol. For this exhaustion the extraction apparatus described by us in a former paper (*Pharm. Journ.*, [3], xiii., 663) was employed and the hot digestion and repercolation continued until a few drops of the solvent after passing through the marc left no residue on evaporation. The percolate was agitated with 25 c.c. of a 5 per cent. solution of sulphuric acid, the chloroform separated and agitated again with 10 c.c. of the dilute acid. The mixed acid solutions were filtered if necessary, rendered alkaline with ammonium hydrate, and shaken with two successive 15 c.c. of chloroform, or with a sufficient quantity to thoroughly extract the alkaloid. The chloroform was separated, if necessary filtered, evaporated, and dried at 100° C., until constant in weight, which usually occupied one hour. Some little trouble is always experienced in the separation of chloroform from aqueous liquids, especially when alkaline; the separation is much facilitated by heat, but even then, often much depends upon the ingenuity and dexterity of the experimenter. It may here be stated that in the filtration of aqueous liquids containing chloroform if the filter-paper is well wetted with chloroform the chloroform alone will pass through from the mixture, leaving the aqueous liquid; but if on the other hand the paper be wetted with water the aqueous liquid will flow through, leaving the chloroform upon the filter.

The appended tables show the results of our analysis of the two series of specimens of nux vomica. It will be observed that although the specimens in the two series differ in alkaloidal content, the order of content in each series is precisely the same, that is, Bombay first, Cochin second, and Madras third. These results are at once interesting and important. The specimen of "Bombay" in the second series contains the largest percentage of alkaloid yet recorded in the seeds of *Strychnos Nux-vomica* (3·90). Of the specimens (? source) examined by Dragendorff,* the highest percentage of total alkaloid found was 2·88. In the series of commercially powdered nux vomica previously analysed by us (*Pharm. Journ.*, [3], xiii., 665), the richest specimen yielded 3·57 per cent. The present results also show that these above-mentioned specimens of powdered nux vomica were of good quality and free from adulteration. The pharmaceutical aspect of the great difference in the alkaloidal content of the various specimens of *Strychnos Nux-vomica* disclosed by these results is of no small moment; upon this point we shall dwell at a future time. We also hope to perfect an accurate method for the separation of strychnine and brucine.

* Die Chemische Werthbestimmung einiger Starkwirkender Droguen, p. 65.

SERIES I. (collected 1877).

Specimen	Diameter.	Thickness.	Circumference.	Nature of Edge.	Texture	Form.	Interior.	Percentage of strychnine and brucine.
BOMBAY Fine.	20·25 to 25·5 mm. average 23·0.	4·0 mm.	60·0 to 82·5 mm. average 70·0.	Generally acute.	Very silky.	Nearly flat; fairly regular; few concavo-convex and bent.	Cotyledons 7-veined; two outer veins small.	3·46
BOMBAY Ordinary	19·0 to 28·0 mm. average 23·0.	5·0 mm.	60·0 to 82·5 mm. average 70·0.	Generally rounded; some acute.	Silky.	Nearly flat; some irregular; few concavo-convex.	Cotyledons 7-veined; two outer veins small.	3·14
COCHIN	19·0 to 28·0 mm. average 23·0.	4·0 to 6·0 mm. average 5·0.	57·0 to 79·0 mm. average 68·0.	Round; few acute.	Silky.	Nearly flat; some concavo-convex; many irregular.	Cotyledons 7-veined; two outer veins small.	3·04
MADRAS .	12·5 to 23·0 mm. average 18·0.	4·0 to 5·0 mm. average 4·5.	38·0 to 71·0 mm. average 57·0.	Generally round; seldom acute.	Dull.	Nearly flat; some slightly concavo-convex; some irregular.	Cotyledons 7-veined; two outer veins small; albumen resinous.	2·74

SERIES II. (collected 1883).

Specimen	Diameter.	Thickness.	Circumference.	Nature of Edge.	Texture	Form.	Interior.	Percentage of strychnine and brucine.
BOMBAY .	20·0 to 28·0 mm. average 23·0.	2·25 to 4·0 mm. average 3·5.	59·0 to 84·0 mm. average 73·0.	Nearly all acute.	Very silky.	Nearly flat; fairly regular; some concavo-convex.	Cotyledons 7-veined; two lateral veins small and sometimes indistinct.	3·90
COCHIN .	19·0 to 28·0 mm. average 25·0.	4·0 to 5·0 mm. average 4·5.	57·0 to 84·0 mm. average 74·0.	Round.	Slightly silky.	Nearly flat; few slightly concavo-convex.	Cotyledons 7-veined; two lateral veins indistinct.	3·60
MADRAS .	12·5 to 21·5 mm. average 19·0.	4·0 to 5·0 mm. average 4·75.	38·0 to 65·0 mm. average 57·0.	Round.	Dull.	Nearly flat; some slightly concavo-convex.	Cotyledons 7-veined; two lateral veins indistinct; albumen resinous.	3·15

THE NEW PHARMACOPŒIAS FOR THE UNITED STATES AND GERMANY.

(*Continued from page* 1035.)

SENEGA, U.S.P.; RADIX SENEGÆ, P.G.—A description of the root is now given in the U.S.P., in which the length is given as 10 centimetres, but the average width is omitted. The P.G. gives the limit of width of the rootstock as 1½ centimetres, and the length of the root branches as 2 decimetres, while the bark should not exceed 1 millimetre in diameter. Both Pharmacopœias mention the keel which is characteristic of senega root of good quality. The rootstock of the Northern senega, now so frequent in commerce, derived from the *P. senega*, var. *latifolia*, much exceeds the dimensions here given, and is therefore excluded from the P.G. by the limits imposed.

SENNA, U.S.P.; FOLIA SENNÆ, P.G.—The U.S.P. omits *Cassia obovata*, D.C. Alexandria senna should be freed from stalks and from argel leaves, which are thicker, veined, glaucous, and even at the base. India senna should be free from stalks, discoloured leaves and other admixtures. Alexandria senna is described as nearly smooth and India senna as slightly pubescent, the reverse being the case in English commerce. The P.G. now admits the leaves of Tinnevelly senna, and mentions *Cassia angustifolia* as their botanical source. It states that the leaflets of *Cynanchum Arghel* are commonly mixed with those of *Cassia acutifolia*, but does not order their removal, remarking only that senna leaves should not be brownish or yellowish. It states that the argel leaves may be easily recognized by the ornament of short rigid hairs. This, however, is not the case, since both Alexandria and Tinnevelly sennas have similar hairs. The minutely wrinkled surface of the argel leaves is the best character by which to recognize them with the naked eye, especially when the base of the leaf is broken off.

SERPENTARIA, U.S.P.—The root is now omitted from the P.G. The U.S.P. restricts the official drug to the roots of *Aristolochia Serpentaria*, L., and *A. reticulata*, Nuttall, remarking that the roots of *A. reticulata* are coarser, longer, and less interlaced than those of *A. Serpentaria*. It is *A. reticulata* which is generally sold in English commerce as the root of *A. Serpentaria*.

SERPYLLI HERBA, P.G.—It must be borne in mind by those who have to dispense German prescriptions that *Herba Serpylli* and *Herba Thymi* are not synonyms for the same plant, but that the former indicates *Thymus Serpyllum* and the latter *Thymus vulgaris*.

SINAPIS NIGRA, U.S.P.; SEMEN SINAPIS, P.G.—The seeds of *Sinapis alba* are not official in the P.G., but both species are noticed separately in the U.S.P. The P.G. states that the cooled and filtered decoction of powdered seeds should not afford a blue colour with iodine water.

SPIGELIA, U.S.P.—The rhizome and rootlets only are official. The rhizome should be 2 inches or more long and about ⅛ inch thick, and the rootlets purplish dark brown. It should not be confounded with the underground portion of *Phlox Carolina*, L., the rootlets of which are brownish yellow, rather coarse, straight, and contain a straw-coloured wood underneath a readily removable bark.

STAPHISAGRIA, U.S.P.—The seeds of *Delphinium staphisagria*, L., are now official, but the seed of *D. Consolida*, formerly official in the secondary list under the name of Delphinium, is omitted.

STILLINGIA, U.S.P.—The root of *Stillingia sylvatica*, L., is described as being about 12 inches long and nearly 2 inches thick, sub-cylindrical, slightly branched, compact, wrinkled, tough, greyish-brown, breaking with a fibrous fracture, showing a thick bark and porous wood, the mixed bark and medullary rays with numerous yellowish-brown resin cells; odour, peculiar; taste unpleasant, bitter, acrid and pungent. The root, as usually seen in this country, is rarely an inch in diameter. Attention has recently been called to this drug by Dr. Marion Sims as a remedy in syphilis (*Brit. Med. J.*, March 10, p. 449).

STRAMONII FOLIA, U.S.P.; FOLIA STRAMONII, P.G.—The P.G. directs that the leaves should be collected during the period of flowering, and gives the maximum dose of the leaves as 0·2 gram. The seeds are official in the U.S.P., but omitted from the P.G.

SUMBUL, U.S.P.—The root is referred to *Ferula Sumbul*, Hook. f. The Indian sumbul is not mentioned; an example which might well be followed in a future British Pharmacopœia, since there can be little doubt that the reddish kind mentioned in the last edition of that work is false sumbul, prepared by colouring and perfuming ammoniacum root. As a tincture is official in the U.S.P., and the tincture of the false sumbul is much darker in colour than that of the true drug when made of the same strength, a colour test would have been an advantage.

TABACUM, U.S.P.; FOLIA NICOTIANÆ, P.G.—The U.S.P. directs the commercial dried leaves of *N. Tabacum*, L., up to 20 inches in length, but the P.G. orders leaves "*modicæ magnitudinis specierum cultarum quas habet Nicotiana Tabacum, aere nulla arte adhibita siccata.*" By which it may be supposed that medium-sized leaves of any cultivated variety of *Nicotiana Tabacum* are intended, dried without previous fermentation; but these are not easily obtained in commerce, at least in this country.

TAMARINDUS, U.S.P.; PULPA TAMARINDORUM CRUDA, P.G.—No mention is now made in the P.G. of the Egyptian and West Indian tamarinds, which in the last edition were ordered to be rejected; but judging from the description, the East Indian tamarinds are still the official kind, while the U.S.P. apparently intends the West Indian to be used, since it describes tamarinds as a reddish-brown, sweet, subacid, pulpy mass. The test for copper is not given.

TARAXACUM, U.S.P. Radix Taraxaci is now omitted from the P.G., but Radix Taraxaci cum Herba is retained. It is to be collected in spring before flowering, and dried, and the extract is to be prepared from the dried plant. This plan, as the extract is made with cold water, presents the advantage of excluding the large quantity of inulin often present in extracts made in the autumn.

TEREBINTHINA, U.S.P. and P.G.—The American turpentine is now attributed to *Pinus australis*, Michaux; this name being a synonym of *P. palustris*, Mill. The drug corresponds with the *Thus Americanum* of the B.P. German turpentine is now chiefly that made from *Pinus pinaster* and *P. Laricio*. It should contain 70 or 80 per cent. of resin and 30 to 15 per cent. of essential oil. The crystalline sediment in it should dissolve when the turpentine is heated in a water-bath, and the liquid should form a clear solution with five times its weight of spirit, the solution strongly reddening moistened litmus

paper. Venice turpentine is no longer official in the P.G.

Terebinthina Canadensis, U.S.P.—This should be completely soluble in ether, chloroform or benzol.

Thuja, U.S.P.—The twigs of *Thuja occidentalis* are the part official. This drug apparently owes its introduction to its extensive use amongst the homœopathic section of the community in the United States. Although recommended in Philip's 'Materia Medica' as valuable in certain diseases, it does not appear to have been received with much favour as yet by allopaths.

Tiliæ Flores, P.G.—The botanical names *Tilia ulmifolia* and *T. platyphyllos*, Scopoli, have been adopted instead of *T. parvifolia* and *T. grandiflora*, for the official plants. The warning against the use of the leaves of *T. tomentosa* is now omitted.

Tormentillæ rhizoma, P.G.—The root should give, with forty times its weight of water, an astringent liquor, which with the addition of a small quantity of sulphate of iron should give a bluish-black colour and on the addition of lime water an intense violet sediment.

Tragacantha, U.S.P. and P.G.—The U.S.P. now gives *Astragalus gummifer*, Labill., and other species, as the botanical source. The P.G. mentions *A. ascendens*, *A. leioclados*, *A. brachycalyx*, *A. gummifer*, *A. microcephalus*, *A. pycnoclados*, and *A. verus*, as yielding the gum. The flakes should not be more than 1 to 3 millimetres thick, nor less than ½ centimetre broad, and should be white and diaphanous. The mucilage made by mixing the powder with 50 parts of water should give a yellow colour with solution of caustic soda; the mucilage, when filtered, should yield a filtrate which will not give a blue colour with iodine, although the insoluble matter in the filter should do so.

Trifolii Fibrini Folia, P.G.—Under this name the leaves of *Menyanthes trifoliata* are still official.

Triticum, U.S.P.—The rhizome of *Triticum repens*, L., deprived of the rootlets and collected in spring is official. The segments should be hollow in the centre, about $\frac{1}{12}$th of an inch in diameter, and have a straw-yellow colour and sweet taste.

Ulmus, U.S.P.—The inner bark of *Ulmus fulva*, Michaux, is alone included under this name. *Cortex ulmi*, prescribed in America, would not be at all represented by the *Cortex ulmi* of the B.P. The bark of *Ulmus fulva* has a remarkably mucilaginous taste, which, although described in the U.S.P. as peculiar, can scarcely be said to be so, since it is met with in fœnugreek, *Melilotus cœrulea*, and in several umbelliferous roots.

Ustilago, U.S.P.—Under this name *Ustilago maydis*, grown upon *Zea Mays*, L., is intended. This new introduction into the U.S.P. should consist of irregular masses, sometimes 6 inches thick, enclosed in a blackish membrane containing brownish-black globular, nodular spores. It should be preserved in a dry place and not kept longer than a year.

Uva Ursi, U.S.P.; Folia Uvæ Ursi, P.G. The description in the U.S.P. is so worded as to imply that the leaves are reticulated on the lower surface only, the upper surface being the more strongly reticulated of the two. The P.G. remarks that there should be no glandular dots on the lower surface of the leaves. An infusion of one part of the leaves in 50 parts of water, set aside for some hours and filtered, should give a red colour, becoming violet when a granule of sulphate of iron is added and shaken up with it, depositing after a little while a sediment of an intense violet colour.

Valeriana, U.S.P.; Radix Valerianæ, P.G.—It should be remembered that the upright rhizome of valerian is about 2 centimetres thick, while the horizontal rhizome of cypripedium, which is commonly sold in this country as American valerian, is only 3 millimetres thick and has numerous cup-shaped scars on the curly brittle rootlets. Occasionally this root has been sold in this country as valerian by dealers in herbs.

Vanilla, U.S.P.; Fructus Vanillæ, P.G.—The botanical source is now more correctly given in the U.S.P., as in the P.G., as *Vanilla planifolia*, Andrews. The U.S.P. uses the term "somewhat warty" in describing vanilla, but this character must surely be of exceptional occurrence.

Veratrum viride, U.S.P.—The rhizome is described as upright, obconical, simple, or divided. *Veratrum album* is the only species official in the P.G., but that Pharmacopœia orders the roots to have the yellowish rootlets present, in which condition it is almost impossible to distinguish with certainty between the roots of the two species, the usually more wrinkled and yellowish rootlets of *V. viride* being an unreliable characteristic.

Verbasci flores, P.G.—The species now adopted is *V. phlomoides*; the use of the flowers of *V. thapsiforme* being also permissible. The size and character of the corolla is now given. The flowers should not be of a brown colour.

Viburnum, U.S.P.—The bark of *Viburnum prunifolium* or black haw, is a new introduction, due probably to the reputation it has recently obtained in the United States as a uterine tonic. The bark is described as occurring in thin pieces or quills of a glossy purplish brown colour, with scattered warts and minute black dots; when collected from old wood greyish-brown; the thin corky layer easily removed from the green layer; the inner surface whitish, smooth; fracture short; inodorous, somewhat astringent and bitter. A fluid extract is the only official preparation.

Viola tricolor, U.S.P.; Herba Violæ tricoloris, P.G.—This new introduction into the U.S.P. is probably inserted with a view to the requirements of the German element in the United States, although no preparation is official in that Pharmacopœia. The plant is a common weed in this country.

Xanthoxylum, U.S.P.—The bark of *X. fraxineum* and *X. carolinianum* are still official. The latter is chiefly distinguished by large conical corky projections and stout brown spines arising from a corky base. Xanthoxylum should not be confounded with the bark of *Aralia spinosa*, which is nearly smooth externally, and beset with slender prickles in transverse rows. The bark of *X. fraxineum* occurs in thin, greyish, quilled fragments, about 1 millimetre in thickness; it has a very pungent taste. Under a lens it exhibits minute crystals, a feature not mentioned in the U.S.P.

Zingiber, U.S.P.; Rhizoma Zingiberis, P.G.—The whitened ginger is not official in either Pharmacopœia.

Zedoariæ Rhizoma, P.G.—The root of *Curcuma zedoaria*. Under this name is intended the greyish root with a camphoraceous taste produced by *Curcuma Zerumbel*, Roxb., and not the yellow root formerly known as "cassumunar root," which is obtained from *Curcuma zedoaria*, Roxb.

CONVALLARIA MAJALIS.*

BY H. G. GREENISH.

It has frequently been remarked that the *Convallaria majalis*, or lily of the valley, can scarcely be classed with the so-called "new remedies" as it is in reality a very old one. But nevertheless with regard to its application in medicine it is truly a "new remedy."

Although in many of the recent publications on Convallaria allusion has been made to its employment by the Russian peasants from time immemorial as a remedy for dropsy, its history in more modern times and in our own country has received but little attention. As the latter possesses for us a greater attraction, and is not without interest, I may be permitted to trace it, as well as I can, for the last three or four centuries.

Apart, therefore, from the mention made of it by Dioscorides and from its use in Russia, a description of the plant was published in 1517 in the 'Ortus Sanitatis' and illustrated by a woodcut, which, though rough, sufficiently resembles it to allow of recognition.

"Neither the leaves nor the roots," says the author, "are used in medicine; the virtues reside in the flowers;" to these aperient properties are attributed. They are prepared for medicinal use by infusing in white wine, distilling the infusion and mixing it with lavender water and pepper. This exclusive use of the flowers and the method of preparing them continued general for centuries.

In 1586 Rovillius honoured the lily of the valley with a lengthy notice in his 'Historia Plantarum.' The flowers and fruit are said to be warm and dry; the former are useful in apoplexy, epilepsy, vertigo, palsy and other diseases proceeding from a cold and damp brain; hence the juice or a decoction of the plant is administered in such cases. It is also said to be employed to cure leprosy, to remedy blindness or indistinct vision, and to counteract the bites of poisonous animals. Some persons, according to Rovillius, make a preparation by infusing the flowers in white wine and distilling as just described.

In 1633, we find it mentioned in Gerard's 'Herbal." In 1639 it is admitted into the Pharmacopœia Londinensis, in which it constitutes an ingredient in the Aqua Antepileptica. The flowers were infused in white wine and distilled, but any specially anti-epileptic property this preparation may have possessed might have been attributable to some other of the nineteen substances that entered into its composition. Possibly it was found to be unsatisfactory, either in its effects or in the number of ingredients it contained, for in the next edition, the latter is increased to twenty-seven and the name changed to a much more familiar one, viz., "Spiritus Lavandulæ Compositus." This preparation still contained the flowers of the lily of the valley, *flores lilii convallii*, and appears to have been a more effectual preparation, as it remained in the Pharmacopæia till 1746.

The lily of the valley must certainly about this time have been held in high estimation. Schröder, in his 'Compleat Chemical Dispensatory,' mentions six preparations of the flowers, the roots being but seldom used. He ascribes hot and dry virtues to them, and powdered, he says they form an excellent sneezing powder. And its celebrity was not confined to our own country. In France, Germany and Belgium it was a well-known drug. The Royal Pharmacopœia of France, published in 1678, contains several preparations into the composition of which it enters, as for instance, an "apopletick water," a "paralitick water," a "corrected antiepileptic water of Langius," which latter is said to be much bettered by the addition to it of shavings of human skull.

In Germany it was the subject of dissertations by Doederlinus in Altorf, 1718; Senckberg in Göttingen, 1737; Mossdorp in Magdeburg, Schulze in Halle, 1742.

From this time until its re-introduction some years since by the Russians but little is heard of the plant. In 1810, Lewis, in his 'Complete Dictionary of Materia Medica,' observes that the watery or spirituous extracts of the flowers act as gently stimulating aperients and laxatives and seem to partake of the purgative virtues as well as the bitterness of aloes. The roots possess the same properties in a greater, the leaves in a lesser degree.

The properties that have been attributed to the lily of the valley are, as we have seen, manifold. It was well known as an aperient and is mentioned as such in the 'Ortus Sanitatis.' It has even been proposed as a substitute for scammony. But the prevailing idea was that a distillate of the flowers was a remedy for epilepsy and apoplexy.

Of the real properties of the drug and of its composition little or nothing was known until Walz, in 1857, isolated the active principles, and Marmé, ten years later, determined their physiological action. In 1865, Martin announced the presence of an alkaloid, majaline, but Tanret was unsuccessful in his endeavours to isolate it. The experiments of Marmé showed that the convallamarin, which possesses a bitter taste and is soluble in water, was a powerful cardiac poison, and acted also, in large doses, as an emetic, whilst the convallarin produced purgative effects without any secondary symptoms.

A few words on the botanical and chemical relationships of Convallaria and its active principles may not be out of place here.

The lily of the valley is generally placed in the natural order Liliaceæ, sub-order Asparagaceæ; its nearest botanical allies are, therefore, the various species of Polygonatum or Solomon's Seal, Majanthemum, Paris and others of the same sub-order, whilst the sub-order Smilaceæ is but little further removed. The first of these, Polygonatum, probably contains active principles similar to or identical with those of the Convallaria. The paridin and and paristyphnin found by Walz in the *Paris quadrifolia* await closer investigation; possibly they may be shown to exercise a similar physiological action. The various species of Smilax contain parillin, which agrees with convallarin in bearing a certain resemblance to saponin. Several species of Trillium and Medeola, both of which are closely allied to Convallaria, are reputed to possess emetic and diuretic properties, and may, therefore, prove to contain cardiac poisons. It is a remarkable fact, says Professor Husemann, that all well-established cardiac poisons are glucosides. Many of them are accompanied in the plants yielding them by other principles possessing a different physiological action; as, for instance, the digitonin of digitalis, which has no action on the heart, the helleborin of hellebore, the convallarin of convallaria. Most of them, in addition to their action on the heart also produce emetic and diuretic effects. Thus several species of squills have long been known as diuretics. One of them only, *Scilla maritima*, has been closely investigated; it has yielded in addition to other principles a powerful cordiac poison, scillitoxin, and an inert substance, scillin.

In 1880, Troitzky and Bojojawlkensky, two Russian physicians, conducted some experiments with Convallaria, but their investigations do not appear to have attracted much attention. Soon afterwards another of their countrymen, Professor Botkin, of St. Petersburg, published a case of neurosis of the cardiac apparatus taking the form of angina pectoris accompanied by palpitation and dyspnœa, in which the palpitation and dyspnœa were almost immediately relieved by the Convallaria. "Our usual cardiac remedies," say Professor Botkin, "digitalis and adonis, have no effect whatever in the vast majority of cases of cardiac neurosis, whilst Convallaria generally acts as a specific."

About the same time Dr. Alfayef, military surgeon in the Caucasus, where the flowers of the Convallaria have a great reputation amongst the people as a remedy for intermittent fever, reported the trial of them in thirty-eight such cases, but the success he met with was in-

* Report on Pharmacology, read before the School of Pharmacy Students' Association.

different. Small doses, he found, invigorated the pulse much more noticeably than large ones, and possessed at the same time a marked diurctic action. "I am, therefore, inclined to think that the convallaria acts as a diuretic only as it stimulates the heart's action, and consequently increases lateral blood pressure, being similar in this respect to digitalis. But its great advantage over digitalis is that it is quite harmless, even in overdoses." There is, however, probably a limit to the overdose that may thus be taken with impunity.

Dr. Ott experimented upon rabbits with an extract of the roots, and concluded that it acted probably directly on the muscular tissue of the heart, whilst the action of digitalis was due to cardio-inhibitory excitation.

Professor Sée found an extract of convallaria in doses of 5 to 8 grains relieved cardiac distress in severe cases of mitral regurgitation and considered it might be used in all forms of heart failure, as it had none of the nauseating effects of digitalis and did not exhaust the contractility of the heart and arteries. Dr. Sansom employed it as a substitute for digitalis, and though convinced of its action in promoting a stronger ventricular contraction was not convinced of its superiority to digitalis.

The preparation of convallaria most suited for administration in heart disease is a matter of interest to us all. As the active principle is not volatile, the distilled waters that we have seen were the favourite preparations up to the end of the previous century are out of the question. Professor Sée, in 1883, undertook to solve the question, and with this object instituted a series of experiments in his clinical practice at the Hotêl Dieu, in Paris. Aqueous and alcoholic infusions and extracts were tested, and they were classed by Professor Sée in order of merit as follows:—

1. Aqueous extract of the leaves, which requires a dose three times as large as the extract from other parts of the plant.

2. Extract of the flowers which exercises a very intense action on animals, much less so on man.

3. Extract of the whole plant, including flowers, stalks and roots (and ? leaves).

The dose was ascertained to be about 1 to 2 grams of the extract of the flowers or double that of the extract of leaves.

The order of merit should evidently be reversed, as Nos. 2 and 3 are both more active than No. 1.

About the same time, M. Langlebert published a similar paper. He found that the extract of the flowers and stalks gave good results, unaccompanied by vomiting or purging.

The preparations of the roots and of the leaves fulfilled the therapeutic indications, but possessed emetic and purgative properties if the dose given were too high. He attributes this action, which was exhibited by a series of extracts, to the presence of too large a proportion of roots in the crude material. The best results were obtained with an extract prepared from the flowers and stalks to which one-third of their weight of roots and leaves had been added. Dose from $\frac{1}{2}$ to 2 grams.

The reason for the addition of the roots and leaves is not stated, and is by no means evident. If they produce unpleasant emetic and purgative properties why add them at all? It must be observed that the dose is much larger than that recommended by Alfayef, viz., 5 to 10 grains of flowers or 20 to 30 drops of the tincture (1 to 4). Such small doses are said to act much better than larger ones (1 to 4 drachms of tincture). Is it not possible that the emetic action observed by Professor Sée was due to the greater activity of the extract of the leaves, for Marmé expressly states that the convallamarin itself when administered in large doses produces vomiting? The purging would be attributable to the convallarin.

Tanret comments upon the unsatisfactory nature of Messrs. Sée and Langlebert's results, and advises the administration of the active principle, which can easily be obtained in a state of approximate purity. Unless, however, the amount of impurity be constant it is difficult to see the desirability of this step.

The pharmacist that is desirous of adding a preparation of convallaria to his stock of drugs may well be at a loss to know which part of the plant he should select. Shall he, with Dr. Alfayef, make a tincture of the flowers, 1 in 4? or follow Professor Sée's advice and, having mixed flowers, leaves and stalks in certain proportions for reasons he is unable to fathom, proceed to make from them an extract? Or again, shall he act upon Tanret's suggestion and prepare the active principle in a state of approximate purity? From the literature on the subject no satisfactory answer is to be obtained; but is it not probable that any part of the plant, flowers, leaves or roots, that contains the convallamarin may be used; that the average dose will vary directly with the amount of that principle present, and that in each individual case a series of experiments must be made to determine the individual dose?

Digitalis, it is said, fails in the majority of cases in which it is tried, and the want of a drug exerting a more constant and uniform action on the heart is generally acknowledged. Nothing but a lengthy and systematic trial can, I think, show whether or not digitalis is likely to be superseded by the *Convallaria majalis*.

COMMERCIAL POWDERED RHUBARB AS COMPARED WITH A PERFECT STANDARD.*

BY GEO. W. HAYES.

The "Standard" rhubarb with which the "samples" were compared was personally selected by Mr. Charles Bullock, of the well-known firm of Bullock and Crenshaw, Philadelphia. I have Mr. Bullock's word for it that it "is a fair representative of the market at the present time—*of a good article*—of Chinese rhubarb." "To make assurance doubly sure," I carefully inspected each *piece*, and compared it with the description found in the 'National Dispensatory' (Stille and Maisch), and found it to agree to every characteristic of a first-class article. It was obtained from one of the most reputable houses in the country; selected by one of America's most prominent pharmacists and judges of the quality of drugs; and was then rigidly compared with one of the best authorities on the subject. The "standard" was broken into pieces; carefully dried; powdered in a scrupulously clean iron mortar; sifted; and placed in a tin box with a tightly fitting lid.

The "Samples" were obtained strictly according to the spirit and letter required by the rules of the competition. A friend of the writer obtained all the Philadelphia "samples," in order that the firms from whom they were obtained might not suspect the purpose to which they were to be put. In order to make the tests entirely free from *bias*, caused by knowing the price, source, etc., of the different specimens, each was placed in a tin box with a tight-fitting lid, by a friend, a young pharmacist, each was then carefully marked by him with an appropriate letter or figure, and all information respecting them, together with their corresponding symbols, placed by him in a sealed envelope, not to be opened until the investigation was completed. The only thing the writer knew was the source, etc., of the "standard." Twelve average "samples" were thus obtained and subjected to all the tests. Thinking that the examination for the presence of turmeric was worthy the examination of a much larger number of samples, seventeen additional samples were obtained, and the entire number (thirty in all, including the "standard") tested for this adulterant.

* Extract from the first-prize essay written in competition for prizes offered by Allaire, Woodward and Co., Peoria, Ill. Reprinted from the *The Druggists' Circular and Chemical Gazette*.

The tests were made entirely independently of one another, and were not in any way compared, until the entire investigation was finished. This was done for the purpose of avoiding any undue favourable or unfavourable bias, which one test might exercise upon the results of another. The writer believes that he can most conscientiously say that he has made a most thorough examination of the literature on the subject of Tests for Rhubarb, and that but very little has been written upon this subject which he has not consulted. Some tests, not previously disputed, have proved themselves valueless in his hands. A list of these will be found accompanying this essay. (See appendix.)

The tests are divided into five sections, namely: 1. Physical; 2. Pharmaceutical; 3. Chemical; 4. Microscopical; 5. Physiological.

1. *Physical Tests.*

I. *Colour.*
II. *Smell.*
III. *Taste.*
IV. *Action in the mouth.*

2. *Pharmaceutical Tests.*

These tests were all tried under exactly the same circumstances; in similar vessels, same amount made in each case, as nearly as possible at the same time, etc.

V. *Infusion.*—Four grains in 2 fluid ounces of water at ordinary temperature. Allowed to infuse two days, then noted colour of infusion.

VI. *Decoction.*—Four grains in 2 fluid ounces of water. Boiled for a few minutes, and, when cold, added water to make 2 fluid ounces. Set aside for a day, then noted colour and apparent value of sample, as before. All but three were rather turbid.

VII. *Alcoholic Tincture.*—Ten grains to 2 fluid ounces of stronger alcohol (95 per cent.) allowed to macerate for thirty-eight days, then noted colour. The samples gave but very slight variation in the colour of their tinctures, consequently it is impossible to arrange them in a graded series, as in the case of the infusion and decoction.

VIII. *Chloroformic Tincture Stain on Filtering Paper.*—Three grains to 1 fluid drachm of chloroform. Allowed to stand for a day. The clear tincture was then carefully poured over a piece of filtering paper, and the paper dried. The different stained papers were then compared and their colours graded. This test is a modification of Howie's test. Of the stain produced Mr. Howie says: "With really fine, bright-coloured East Indian rhubarb, this stain is scarcely perceptible, but cheaper and darker samples may yield a brilliant yellow stain, while even the finest bright-coloured English rhubarb will give a yellow stain as deep, and in most cases deeper, than the darkest East Indian."

Ethereal Tinctures of the different samples did not give sufficient variability of colour to be used as a test.

IX. *Solid Aqueous Extract.*—Distilled water being used; and, in each case, the drug was *thoroughly* exhausted and the extract thoroughly dried. It is but fair to state that Dr. Squibb says in regard to this test: "The foolish test of an aqueous extract does more harm than good. . . . Our *garden* rhubarbs will yield over 40 per cent. of aqueous extract at any time." Yet it appears to be possessed of enough value to entitle it to be used in connection with other tests.

X. *Moisture.*

XI. *Portion Insoluble.*—After *thoroughly* percolating drug with cold distilled water.

XII. *Height of Sample* in beaker after allowing 100 grains of it to infuse in 7 fluid ounces of distilled water for fifteen hours. Height from bottom of beaker to surface of water equals 4·25 inches. This test was used by Mr. Greenish, one of Dragendorff's pupils.

XIII. *Test with Calcined Magnesia and Essence of Anise*, B.P.—Rillot's test. Three grains were triturated with 3 grains of calcined magnesia in a perfectly clean mortar. Two drops of essentia anisi, Br.P., was then added, and the mixture triturated thoroughly. The mixture was then placed on a clean piece of white paper, flattened out on the top with a spatula, and allowed to stand two days. The colour of the sample was then noted. According to Rillot, if any rhapontic rhubarb be present, the colour of the mixture will be more or less "decidedly rose." All of the mixtures changed colour somewhat, after the essence of anise was added and the mixture allowed to stand, but only those containing rhapontic rhubarb changed to a more or less "decidedly rose;" the colour of the other mixtures varied from a bright salmon to a light brownish-yellow.

3. *Chemical Tests.*

Tests for Turmeric.—As before remarked, thirty samples in all (including the "standard") were tested for turmeric by Howie's test. Three grains were placed, in the form of a cone, on a piece of fine white filtering paper, and 50 drops of purified chloroform were slowly and carefully dropped on the apex of the cone; a stain was left. When dry, the powder was brushed away, and a pinch of borax placed on the most stained portion of the paper, and a drop of hydrochloric acid allowed to fall upon the pinch of borax. According to Howie, "If turmeric is present, a red colour is produced, . . . while no change, or only a slight bleaching, occurs, if the rhubarb is pure." In order to be very accurate, each of the samples was tested twice. Two gave a most conclusive red colour in both testings. As neither of them belonged to the regular samples (the twelve powdered "samples" and the "standard"), it may be of interest to state that the *first* came from a small wholesale drug house of Philadelphia. The proprietor of the place stated, when the sample was obtained, that the drug was "powdered for us from SELECTED roots. We KNOW it is PURE". His price for this PURE article was sixty cents a pound. The *second* came from a well-known large wholesale house of Philadelphia, price, fifty cents a pound. It must have been either bought already powdered, or been coloured by some drug miller, who was more anxious to turn out a nice-looking article than to maintain his customer's professional reputation. I feel confident that the firm is too honest and too rich to be a conscious party to any sophistication.

In regard to the active principles of rhubarb, there appears to be some uncertainty. After a very careful consideration of the subject, from a practical as well as theoretical standpoint, it appears that cathartic acid is the purgative principle, and chrysophanic acid and tannic acid the tonic principles. The last two are conceded by all to be contained in rhubarb. The first is most positively asserted to be a constituent of rhubarb, by such chemists as Dragendorff and Greenish; and in their published analyses of rhubarb, is given as being the only purgative principle. Watts's 'Dictionary of Chemistry' says; "Cathartic acid appears to be the purgative and tannin and chrysophan the tonic principles of rhubarb." Again, in the 'Proceedings of the American Pharmaceutical Association,' 1879, p. 151, it is stated that "the active principles of rhubarb are cathartic acid, chrysophan, tannin." Mr. John E. Cook, Assistant Professor of Materia Medica, Philadelphia College of Pharmacy, stated the other day, in the writer's presence, that "rheocathartic acid is the cathartic principle of rhubarb." If the writer may be excused the liberty of referring to his own experiments, in such a connection, it appears to him beyond doubt that cathartic acid is the cathartic principle.

The course of analysis is essentially that of Mr. Henry G. Greenish (see *Pharm. Journ. and Trans.*, May 17, 1879, pp. 933–936).

XIV. *Mucilaginous Matter.*—One hundred grains was completely exhausted with cold distilled water, the percolate was carefully evaporated to 30 cubic centimetres, and when cool, to this was added 45 c.c. of stronger alcohol (95 per cent.); the mixture was well shaken and

set aside for twenty-four hours. The precipitate was then carefully collected on a tared filter, well washed with stronger alcohol, dried and weighed.

XV. *Cathartic Acid.*—The filtrate was then carefully evaporated to dryness, and carefully dissolved in stronger alcohol, with the very smallest amount of distilled water, to make a clear solution of 15 c.c. To this was added 120 c.c. of absolute alcohol, Squibb's (warranted not below 99·75 per cent.), and the vessel well corked and set aside for twenty-four hours. The precipitate was then collected, washed with absolute alcohol, dried, etc.

XVI. *Chrysophanic and Tannic Acids.*—The filtrate was carefully evaporated to dryness, and dissolved into distilled water with just sufficient stronger alcohol to make a clear solution of 30 c.c. To this was added, as long as it produced a precipitate, a solution of acetate of copper, C. P. The precipitate was rapidly collected, washed with the smallest amount of distilled water, dried, weighed, etc. This precipitate consisting of a mixture of chrysophanate and tannate of copper, it was necessary to subtract from its weight the weight of the oxide of copper it contained, which, according to the mean of several of Mr. Greenish's analyses, equalled 26·82 per cent. This being subtracted, the remainder was placed as *chrysophanic and tannic acid.*

4. *A Microscopical Test.*

XVII. Each of the samples was examined by means of the microscope. A power of 100 diameters was found best. Each sample was tried by transmitted as well as reflected light. Was unable to find any adulterant by this means, though somewhat of a difference was noticed in the relative amounts of the three different colours (yellow, white, red).

5. *Physiological Test.*

Eight grains of each of the "samples" (including the "standard") was taken internally by the writer at about the same time in the morning, at periods sufficiently distant from one another, so as not to in any way interfere. Each sample was tested as nearly as possible under the same circumstances. As a result, it was found that in almost every case, the purgative activity of the drug was in almost direct proportion to the amount of cathartic acid found in it; making, of course, due allowance for the counteracting tendency exerted by the presence of a small or large proportion of chrysophanic and tannic acid.

Price, etc., of the Samples.

XVIII. Every precaution was taken to keep the seller from suspecting the purpose to which the sample was to be put. The only reason why his *claim*—in regard to the sample gotten from him—was obtained, was for the purpose of ascertaining where to locate the deception, in case of such, as well as to make the essay, in a measure, more complete.

It may be well to state here that it was the writer's original intention to make a complete test, by all the methods given above, of 30 *samples* (including the "standard"); but he soon found that it would require almost a year to properly do so, so he has had to content himself himself with the twelve "samples" and the "standard." The tests have occupied all of the writer's available time for the past three months.

General Conclusions.

1. Out of twelve "samples," four (4), or 33 *per cent.*, were adulterated with *rhapontic rhubarb.*

2. Out of twenty-nine "samples" two (2), or nearly 7 *per cent.* were *adulterated* with *turmeric.*

3. From test VIII., together with the "Chemical Tests," it is believed that at least one-quarter of the "samples," or 25 *per cent.* were *adulterated* with *inferior, poor, dark-coloured, perhaps worm-eaten rhubarb.*

4. Taking all of the "Pharmaceutical Tests" together *none* of the "samples" *equalled* the "standard."

5. Chemically the "standard" was the *fourth* (4th) in *purgative power* (cathartic acid) and the *second* (2nd) in *tonic constituents* (chrysophanic and tannic acids). It contained almost *twice* as much cathartic acid as one sample, and over *four* times as much *chrysophanic and tannic acid* as another.

6. The *price* is no *just criterion of* either the *cathartic* or *tonic* power of the drug.

Appendix.

Tests that have been found in the writer's hands to be unreliable:—

Physical.

Dr. Squibb's. — "When two powders (rhubarb) are exposed on a table to the action of light and air for two weeks, the powder of the bad or mixed rhubarb turns of a *very light colour*; it changes its colour entirely, while the good rhubarb does not change to anything like the same extent."

On the contrary after repeated trials, I have found that any sample of powdered rhubarb, instead of becoming lighter, will in every case become darker, after being exposed to light and air for two weeks.

Pharmaceutical.

Dragendorff's.—"According to Dragendorff, the presence of chrysophanic acid in a condition (free) extractable by cold petroleum spirit, is a test of the quality of the rhubarb. Good rhubarb yields a colourless extract with petroleum spirit, while a rhapontic rhubarb yields an intensely yellow extract."

All the "samples" (including the "standard") gave exactly the same coloured solution, namely, a bright yellow.

Chemical.

Normandy's.—Gamboge "may be readily detected by digesting a portion of the powder in ether, and pouring a few drops of the solution in water. If gamboge is present, a film of an opaque yellow colour will be observed floating on the surface, which, on adding potash, is dissolved with an intensely red colour."

All the samples acted the same way with this test, giving a red colour. A small portion of the "standard" was purposely adulterated with 5 per cent. of gamboge, and both it and some of the unadulterated "standard" tested by this test. No difference could be observed; both solutions becoming red.

NEW COLOUR REACTIONS OF THE ALKALOIDS.*

BY B. ARNOLD.

The author describes the behaviour of various alkaloids with certain reagents; the most distinctive are the following:—

Conine.—One drop, when mixed with a few drops of syrupy phosphoric acid, and the mixture evaporated in a white porcelain capsule over a small flame, becomes a fine green to blue-green.

Nicotine similarly treated gives a deep yellow to orange, the residue is soluble in water; the same colour. The reaction is more surely obtained when the mixture is heated for five to ten minutes on the water-bath. Conine when so heated shows a clearer green.

Aconitine.—The well-known violet colour given by this alkaloid when evaporated with phosphoric acid, is obtained easily and surely by agitating a few particles with syrupy phosphoric acid and warming ten to fifteen minutes on the water-bath.

The syrupy acid used as the reagent is obtained by dissolving the anhydride or the glacial acid in the officinal phosphoric acid of the German Pharmacopœia.

The author suggests that the ptomaconine of Selmi should be tested by this reagent.

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* *Arch. Pharm.*, [3], xx., 561–566. Reprinted from the *Journal of the Chemical Society*, March, 1883.

Portions of other alkaloids yielded characteristic reactions when rubbed with a few drops of concentrated sulphuric acid and gently warmed; alcoholic or aqueous potash solution (30 to 40 per cent.) is then dropped in by means of a capillary tube with constant stirring until in excess. Narcotine, morphine and codeine give the most striking reactions.

Narcotine, in course of heating with the acid, takes a yellow, or if warmed longer, a violet colour. On the addition of alcoholic potash, it becomes a fine orange-red, which on adding water passes to yellow; treated with *aqueous* potash solution, the final reaction shows a gamboge-yellow, soluble, unchanged in water.

Morphine on the addition of the alcoholic solution becomes yellowish to dirty red, then turns to steel-blue and sky-blue. The continued addition of the potash solution causes, after a short time, a transition to a fine cherry-red. Water partially dissolves the residue to a red-violet colour: the residue is a fine blue to blue-green, and dissolves with that colour on adding water. Treated with *aqueous* potash solution it passes from red to a fine moss-green, and on further addition of the potash solution to a dirty yellow-brown. The more strongly the morphine is heated with the acid, the more intense is the blue produced on the addition of alcoholic potash.

Codeine gives no reaction with alcoholic potash: with the aqueous solution it passes from reddish to pure green, and then to a dirty white; if it is heated with sulphuric acid until it begins to brown, it gives all the reactions of morphine, and seems to change into that body.

Solanine with the alcoholic solution passes from yellow to blue or red-violet, particularly after standing some time; with more potash it becomes whitish-grey. Sulphuric acid dropped into the mixture to excess causes a cherry-red, which disappears on adding water. Solanine treated with the aqueous potash solution passes from yellow to violet, then to green, and finally dirty yellow-brown. Sulphuric acid added as above causes the same reactions, but the process must be carefully conducted. The cherry-red and its disappearance are very strongly characteristic of this alkaloid. The reaction is most successful when the substance is dissolved in *cold* sulphuric acid and warmed, but not until the solanine becomes brown, as in that case the colour reactions do not take place.

Another method of examination adopted by the author is to rub small portions of certain alkaloids with concentrated sulphuric acid on a white porcelain slab; to the mixture he then adds a few crystals of sodium nitrite. Certain changes of colour occur, which again alter when alcoholic or aqueous potash solution employed in the previous experiments is added in drops, with constant stirring, until in excess; previous warming with the sulphuric acid is not desirable, unless when specially directed.

Atropine with sodium nitrite shows a deep yellow to orange. Alcoholic potash produces a splendid red-violet, quickly passing into pale rose: the more nitrite used, the deeper the colour. Aqueous potash does not produce a colour reaction.

Narceine with sodium nitrite first gives a dirty brown-green, then clear blue margin, the mixture gradually passes to a fine violet, red-violet, and a blood-red. Alcoholic potash changes this to a yellow, but aqueous potash causes the violet to pass through yellow to a dirty brown. When the blue margin appears as above, if the mixture is very gently warmed, it becomes a magnificent blue-violet.

Narcotine with sodium nitrite passes gradually through red, brown and green into a cherry-red. Alcoholic potash added changes this to a dirty orange; *aqueous* potash when dropped into the mixture after the sodium nitrite, shows a green spot after each drop. When it has been added in excess, all becomes a dirty green; when narcotine is warmed with sulphuric acid until yellow, or till the characteristic violet appears, and sodium nitrite is then added, a fine cherry-red immediately makes its appearance.

Strychnine with sodium nitrite gives a dirty yellow. Alcoholic potash changes it to a fine orange-red, the aqueous solution causes it to turn brownish-green, and finally dirty red-brown.

Digitaline with sodium nitrite gives a brown to dirty cherry-red colour, changed by alcoholic potash to a dirty yellow-grey, by aqueous potash to brown: the reaction with the sulphuric acid and sodium nitrite is peculiar to this alkaloid.

Two or three samples of each alkaloid were obtained from different sources. The processes followed in the experiments require a considerable amount of practice, and it is sometimes difficult to exactly specify the shade of colour, for example, whether one should be called brownish-green or greenish-brown; yet with practice the characteristic reactions can be very accurately produced.

CALX SULPHURATA AND SULPHIDE OF CALCIUM.*

A peculiar product obtained by calcining about seven parts of finely-powdered gypsum and one part of powdered charcoal in a covered crucible has long been used in medicine, and has been officinal in various pharmacopœias. The proportion of gypsum and charcoal vary in the latter between eight and three of the former to one of the latter. Soubeiran advises to mix eight of gypsum, four of lampblack and enough of a fatty oil to make a mass. Other formulæ prescribe caustic lime and sulphur. The homœopaths prepare it by heating equal parts of finely-powdered oyster-shells and flowers of sulphur for ten minutes to a white heat. One of the old names of this preparation is *Hepar Sulphuris Calcarcum*, and this is the name it is known by in homœopathic practice. None of the above processes yields a pure sulphide of calcium (CaS), the product being always contaminated with other substances, either undecomposed gypsum or carbonate of calcium, or free lime or free carbon. A *pure* sulphide of calcium can be prepared only with some difficulty.

It is not at all necessary that the "sulphide of calcium" used in medicine shall be absolutely pure. All previous reports of the therapeutic effects of the compound are based on the commercial article—chiefly on that made from oyster-shells and sulphur—and the quality of this, though it only consists in part of CaS, has remained tolerably uniform.

The pharmacopœia only wished to recognize the article already in use, and knowing that the ordinary name by which it was known in practice and in trade, viz., sulphide of calcium, was wrong, inasmuch as the preparation contained only about thirty-three per cent. of the pure sulphide, the revisers selected the more correct old name, which expresses only the fact that the compound is prepared from *lime* and contains *sulphur*, "Calx Sulphurata" = sulphurated lime. A test was, however, appended to estimate the amount of pure calcium sulphide present, and the lowest limit of percentage was placed at thirty-six.

Perfectly pure sulphide of calcium, if ever introduced into medicine, will have to receive the title "Calcii Sulphidum" in the pharmacopœia.

Whether calx sulphurata or calcii sulphidum be prescribed in the United States, the patient will always receive the same substance. It is never "mixed" artificially, the admixtures being inevitable in process of preparation. A fair estimate of the good quality of a sample may be obtained from the odour of the substance, which should be that of a sulphydric acid and should be quite distinct. As a rule we have obtained a better article in the United States from homœopathic manufacturers than from any other source. This is probably owing, at least partly, to the fact that they prepare it more frequently than others, and are thereby enabled to dispense it in a much fresher state.

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* From *New Remedies*, May, 1883.

The Pharmaceutical Journal.

SATURDAY, JUNE 23, 1883.

Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE CHEMISTRY OF STORAGE BATTERIES.

ALTHOUGH the sanguine expectations which were raised by some of the statements that accompanied the introduction of FAURE'S modification of the PLANTÉ battery have not all been fulfilled, enough has been realized to demonstrate that it would be an enormous gain to electrical science if a secondary or storage battery could be devised which should not be too cumbersome and should be capable of giving up, after a reasonable time and at the will of the operator, a large proportion of the energy that has been previously stored up in it. One reason, perhaps, why there has been an apparent delay in the practical application of M. FAURE'S invention is that the physical and chemical conditions which obtain when a current of electricity is passed through a series of lead plates arranged in a bath of dilute sulphuric acid are still imperfectly understood. True, it is known that the first plate in the series, or the one by which the current enters, becomes coated with peroxide of lead, whilst on the last plate of the series a loose covering of metallic lead is formed, and that those conditions become reversed as the plates become depolarized by the discharge of the cell; but the changes leading up to this result have been variously explained. Some writers contend that much of the storage effect depends upon the occlusion of oxygen and hydrogen by the positive and negative plates or their coatings, others that the lead sulphate which is formed plays an important part, whilst others maintain that this lead sulphate undergoes no chemical change. Some of the researches of Messrs. GLADSTONE and TRIBE which throw light upon this subject have already been referred to in this volume (see before, p. 221), and a further important elucidation of it is furnished in a paper recently read before the Royal Society by Dr. FRANKLAND and published in the latest number of the 'Proceedings.'

It may be stated at once that the first-mentioned theory has now been eliminated from the discussion, since the results obtained by Dr. FRANKLAND in some preliminary experiments justify the conclusion that occluded gases play practically no part in the phenomena of the storage cell. The function of the lead sulphate formed appears, however, to be much more important and so far as it has been traced is exceedingly interesting. During the "formation" of a cell a thin superficial deposit of insoluble lead sulphate is soon formed on both the positive and negative surfaces of the plates; but the amount of sulphuric acid which disappears from the liquid contents of the cell is much more than sufficient to account for the apparent result and is probably used up in the formation of other lead sulphate that is obscured by the chocolate-coloured peroxide formed simultaneously. Unless the coated plates have been immersed previously for several days in dilute sulphuric acid, this disappearance of acid during their "formation" continues for ten or twelve days. At length, however, as the charging goes on, the strength of the acid ceases to diminish, and soon afterwards it begins to augment, the increase continuing until the maximum charge has been reached and abundance of oxygen and hydrogen gases begin to be discharged from the plates. At this point the current becomes occupied exclusively, or nearly so, in the electrolysis of hexabasic sulphuric acid (SO_6H_6), which appears to be the central point with which all the chemical reactions that occur in the cell are connected. On the other hand, during the discharge of the cell the specific gravity of the acid continually decreases until the discharge is finished, when it is found to have sunk to about the same point from which it began to increase during the charging. Hence it is apparent that during the discharge lead sulphate, which has been continuously decomposed in charging, is continually reformed. Dr. FRANKLAND concludes that the chief if not the only chemical changes occurring during the charging of a storage battery are (1) the electrolysis of hexabasic sulphuric acid into sulphuric anhydride and oxygen, eliminated on the positive plate, and hydrogen eliminated on the negative plate; (2) the reconversion in the presence of water of sulphuric anhydride into sulphuric acid; (3) the chemical action of the eliminated oxygen on the coating of the positive plate, resulting in the presence of water in the formation of lead peroxide and hexabasic sulphuric acid; and (4) the chemical action of the eliminated hydrogen on the coating of the negative plate, resulting through an analogous reaction in the formation of spongy metallic lead and hexabasic sulphuric acid. In the discharge of a storage cell, Dr. FRANKLAND supposes the chemical changes to be (1) the electrolysis of hexabasic sulphuric acid as in charging; (2) the reconversion of sulphuric anhydride into hexabasic sulphuric acid, as already described; (3) the chemical action of eliminated hydrogen upon the coating of what was before the positive plate or electrode, but which now becomes the negative plate of the cell,—that is to say the plate from which the positive current issues to the external circuit,—resulting in the reduction of the lead peroxide formed during the charging into lead oxide, which is immediately converted into lead sulphate by the sulphuric acid present; and (4) the chemical action of eliminated oxygen

upon the coating of what has now become the positive plate of the cell, resulting in the formation of lead oxide, which also is at once converted into lead sulphate.

To sum up, Dr. FRANKLAND concludes that the initial action in the charging of a storage cell is the electrolysis of hexabasic sulphuric acid, each molecule of which throws upon the positive plate three atoms of oxygen, and upon the negative plate six atoms or three molecules of hydrogen. Each atom of oxygen decomposes one molecule of lead sulphate on the positive plate, producing one molecule of lead peroxide and one of sulphuric anhydride, the latter instantly uniting with three molecules of water to form hexabasic sulphuric acid. In discharging, as in charging, the initial action is the electrolysis of hexabasic sulphuric acid. The oxygen eliminated on the positive plate reconverts the reduced metal of that plate into lead oxide, whilst the hydrogen transforms the lead peroxide on the negative plate into the same oxide, which in both cases is immediately converted into lead sulphate by the surrounding sulphuric acid, thus restoring both plates to their original condition before the charging began. The discharge of a cell does not proceed so far as to undo the work of "formation;" in fact it is highly probable that in the ordinary use of a storage cell the discharge is never completed.

One practical result of Dr. FRANKLAND'S investigation is that he has been able to suggest an extremely convenient chemical method for ascertaining the extent to which a storage cell is charged, based upon the observation mentioned before that in a "formed" cell the specific gravity of the dilute sulphuric acid increases regularly during the charge, and decreases during the discharge of the cell. The specific gravity and consequent strength of the dilute sulphuric acid of a "formed" cell being known in its uncharged and also in its fully charged condition, it is only necessary to take the specific gravity of the acid at any time in order to ascertain the proportion of its full charge which the cell contains at that moment, and if the duty of the cell is known, the amount of energy stored will also be thereby indicated. In a cell experimented with, containing about seven quarts of dilute sulphuric acid, each increase of ·005 in the specific gravity of the acid meant a storage of energy equal to 20 ampères of current for one hour obtainable on discharge.

In conclusion, it may be mentioned that Messrs. GLADSTONE and TRIBE have recently published a further communication as to the result of their researches upon this subject, in which they deal mainly with the influence of the strength of the acid used in the cell. They state that they have obtained the best results as to the oxygen fixed on the positive plate by using dilute sulphuric acid of a strength of 1 to 10. When a dilution of the strength of 1 to 1000 was used, the amount of oxygen fixed was double as compared with the strength of 1 to 10, but a considerable quantity was taken up in the formation of a basic lead sulphate, with a consequent diminution in the amount of peroxide formed.

As expected, the Medical Acts Amendment Bill did not come on for second reading on Thursday of last week. It was postponed until Monday, and then again until Tuesday, when although it was second on the list, it was not reached. It was then set down for Thursday, but as seventeenth on the list, so that at the time of going to press it had not been reached, nor is it likely to be. A petition to amend the Bill was presented on Friday, the 15th inst., from the Pharmaceutical Society of Ireland. Our readers will notice with satisfaction the continued unanimity amongst pharmacists as to the action taken by the Council of the Society in respect to the Pharmacopœia clause of this Bill, which is further indicated in the resolution passed by the Sheffield Pharmaceutical and Chemical Society, and printed in another part of this Journal.

* * *

Referring to the scheme for the revision of the British Pharmacopœia, as disclosed in the recent report of the Pharmacopœia Committee, *New Remedies* remarks that it is to be regretted that the General Medical Council has not been "more liberally inclined towards the pharmaceutical profession as a body," and given it an opportunity to participitate in the work, rather than pursue the course it has chosen to adopt. Our contemporary thinks that since the General Medical Council is notoriously obliged to go outside of its own organization to secure the necessary skill for revising a work which is as much the property of the pharmaceutical as of the medical profession, "the course pursued in the present instance is not calculated to add to the dignity of the Council, or serve as an example of the fair-play in which our British cousins have so much pride."

* * *

It is not expected that there will be time left for the French Pharmacy Bill to be considered by the present Chamber. The report of the Commission, to which reference was made last week, shows a strong disposition to free pharmacy from all regulations, only restrained by the difficulty of passing from one extreme to the other. It defines, in, so many words, the duty which society owes to its members, in assisting them to form a judgment in such matters, as being limited to saying, "Here is a competent medical man, or a skilful pharmacist; you know that if you resort to him you will be in the hands of a trustworthy man; but if you prefer to go to the bone-setter or to the druggist, which you are free to do, it is not for the law to protect you against your own stupidity." The present time is, therefore, looked upon as one of transition, when there should be nearly complete liberty under the guarantee of a diploma. The conclusions of the Commission appear, however, to be in advance of public opinion in some quarters, for the proposition to allow pharmacists to sell any substance expressly demanded by the purchaser has been denounced in the *Intransigeant* by M. Rochefort as the liberty to poison, and he maintains that laws and regulations in respect to pharmacists cannot be too rigorous. The Minister of Commerce has also succeeded in in-

troducing into the Bill a prohibition of the sale of poisons without the order of a medical man.

* * *

Just now, when some attention has been directed to the position of pharmacists in this country in relation to the supply of alcohol, it may be interesting to mention some privileges that have been accorded to registered pharmacists in the Dominion of Canada, under a new "Licence Act." In this Act it is provided that a registered chemist and druggist shall not be prohibited from keeping, having or selling alcoholic liquors for purely medicinal purposes, but no sales are to be made in quantities of more than six ounces at a time, except under an order from a registered medical practitioner. Further, all supplies of alcoholic liquor are to be registered in a book, which is to be open to inspection, and in no case may the liquor supplied be consumed on the premises of the chemist and druggist supplying it.

* * *

In the discussion which followed the reading of a paper at the Plymouth meeting of the Pharmaceutical Conference, in which a denial was given to the then prevailing belief that the presence of a salt of copper in preserved peas was prejudicial to the health of persons eating them, statements were made as to the longevity of persons subjected to the influence of "copper smoke" or who drink water containing copper. These find strong confirmation in the results of an inquiry made in reference to the circumstances attending the epidemics of typhoid fever that prevailed in Paris in the years 1876–77 and 1882–83. In the former epidemics 2462 persons died from typhoid, of whom only two were workers in copper, whereas fifty would hardly have represented the relative proportion of copper workers to the population. In the more recent epidemic the deaths amongst workers in copper and bronze were equally below the average. A similar immunity has been observed in respect to cholera. A more striking illustration is quoted in the "Bon Accord" Society, consisting of between three and four hundred members, who are all turners, fitters and workers in bronze; this Society has not lost a single member by death from typhoid fever or cholera since its establishment in 1819, and very few from small-pox or diphtheria.

* * *

There appears to be a prospect of a decided improvement in the bark and quinine market in this country. We understand that within the last two weeks large quantities of bark have been sold.

* * *

According to a Report on the Drug Trade of New York, drawn upby Mr. D. C. Robbins, the importations of quinine into the United States during the year ending June 30, 1882, amounted to 794,495 ounces, against 408,851 ounces in the previous year. During the year ending December, 1882, the importation of cinchona bark reached 29,200 bales, against 31,700 bales in the year 1881. This large increase in the amount of manufactured quinine imported and the decrease in the quantity of raw material are attributed to the removal of the high duty on quinine that was formerly levied.

* * *

We understand that the patent rights in kairine, the latest proposed substitute for quinine, have been acquired by the Colour Manufacturing Company in Höchst, formerly Meister, Lucius and Co., by whom it is now being made under the superintendence of Professor Laubenheimer. It appears that two kinds of the drug are to be met with, one called "karin M," which is said to present some advantages, and the other simply "kairin," which represents the substance with which the original clinical experiments were made. Whether kairin will be more successful in ousting quinine as a febrifuge than chinoline, from which so much was expected, appears very doubtful, and we are more inclined to think that the cinchona alkaloids, produced at the moderate price which the spreading cultivation of the cinchona plant appears to bring within a measurable distance, will eventually beat every competitor from the field.

* * *

Some cultivators evidently have faith in the future of cinchona cultivation in India. A writer in the *Madras Times*, who advocates a more free utilization of the assistance that chemists are able to give in selecting the most valuable varieties suitable to particular soils, prophesies that in the event of this being done the average richness of quinine in the total bark gathered, which is taken by the writer to be in that Presidency at present 1½ per cent., will, possibly, by the year 2000, have reached 4½ per cent. If so, should any of the fellow-countrymen of Macaulay's oft-quoted New Zealander happen then to be engaged in the quinine manufacture, they will be within reach of a supply of good bark.

* * *

According to the official report on the Government Cinchona enterprise in Java for the first quarter of the present year, a translation of which appears in the *Ceylon Observer*, the fears that were entertained as to the deteriorating influence of a "succirubra" stem on a "Ledgeriana" graft have proved groundless. Analyses of bark taken from twenty three-year old grafts failed to reveal a trace of cinchonidine, whilst the yield of quinine reached 7·37 per cent. A recent visitor to Java has stated that one private proprietor in that island has five thousand acres of land occupied in *Cinchona Ledgeriana* cultivation, and that the plantation is in a flourishing condition.

* * *

In connection with an Exhibition to be held in Colombo in August, under the auspices of the Colombo Agri-Horticultural Society, a gold medal is offered for the best collection of cinchona barks, and silver medals for the best collections of barks of *C. robusta*, *C. Ledgeriana* and *C. succirubra*.

* * *

The *British Medical Journal* reports a fatal case of poisoning by carbolic acid administered in mistake for a black draught, which has taken place in the Bridgwater Workhouse. A coroner's jury returned a verdict of "Homicide by misadventure."

* * *

We understand that one of the two Research Scholarships recently instituted by the Grocers' Company has been awarded to Dr. Matthew Hay, of the University of Edinburgh, whose name will be familiar to the readers of this Journal. The scholarship is of the annual value of £250, and although the award is for one year only, the holder will be eligible for re-election at the end of that term.

* * *

A meeting of the School of Pharmacy Students' Association will be held on Thursday next, June 28, at 8 p.m., when a paper will be read by Mr. H. Hamilton, on "The Characteristics of the Principal Natural Orders," illustrated by specimens. A Report upon Analytical Chemistry will be made by Mr. C. Thompson on "The Estimation of Carbolic Acid."

Transactions of the Pharmaceutical Society.

EXAMINATIONS IN LONDON.

June 20, 1883.

Present—Mr. Carteighe, President; Mr. Atkins, Vice-President; Messrs. Barnes, Benger, Brady, Corder, Ekin, Fletcher, Gale, Greenish, Linford, Plowman, Tanner, Taylor and Thresh.

Dr. Greenhow attended on behalf of the Privy Council.

MAJOR EXAMINATION.

Six candidates were examined. *Five* failed. The undermentioned passed, and was declared qualified to be registered as a Pharmaceutical Chemist:—

Wedge, George Deller .....Alresford.

MINOR EXAMINATION.

Nineteen candidates were examined. *Twelve* failed. The undermentioned *seven* passed, and were declared qualified to be registered as Chemists and Druggists:—

Ashton, Frederick William ...Market Harborough.
Atkins, Alfred Edward .....Newport.
Austin, George Leonard.....Ashford.
Bachelot, Emile .....Mauritius.
Blain, William Rushton .....Bolton.
Hircock, George Walter .....Kettering.
Joye, Joseph.....Southport.

June 21, 1883.

Present—Mr. Carteighe, President; Mr. Atkins, Vice-President; Messrs. Barnes, Brady, Corder, Ekin, Fletcher, Gale, Greenish, Linford, Plowman, Tanner, Taylor and Thresh.

Dr. Greenhow attended on behalf of the Privy Council.

MINOR EXAMINATION.

Twenty-two candidates were examined. *Ten* failed. The undermentioned *twelve* passed, and were declared qualified to be registered as Chemists and Druggists:—

Hamilton, Henry.....Finchley.
Handford, Thomas Edward ...Torrington.
Kitchin, John .....Ulverston.
McLanachan, John .....Sheffield.
Marsden, Charles Edwin.....Huddersfield.
Martin, John .....Redruth.
Nicholls, Reginald Edward.....Lee.
Silk, Edward .....Macclesfield.
Stocker, George .....Exeter.
Thacker, Henry Ransley.....Nottingham.
Whiston, Edmund .....Wolverhampton.
Wilson, Harry .....Buxton.

MODIFIED EXAMINATION.

Two candidates were examined. *Both* passed, and were declared qualified to be registered as Chemists and Druggists:—

Castell, George Gower..... ...London.
Heathcote, Henry .....Liverpool.

PRELIMINARY EXAMINATION.

The undermentioned certificates were received in lieu of the Society's Examination:—

Certificates of the College of Preceptors.

Church, Albert Victor John ...Norwich.
Croasdale, James C.....Ulverston.
Davison, Daniel .....Cromer.
Jolly, John ....Chorley.
Nicholson, Thomas Brough.....Sunderland.
Reinhardt, Charles Emmanuel..Leeds.
Taylor, Walter .....London.

Certificates of the Faculty of Physicians and Surgeons of Glasgow.

Bolas, Samuel Brittain .....Rock Ferry.
McCurrie, John .....Port Bannantyre.

Certificate of the Royal College of Surgeons of England.

Capper, Percy ....Huyton.

Certificate of the Royal University of Ireland.

Harrold, John P. .....London.

Certificate of the Society of Apothecaries.

Brown, Edgar Marshall .....Derby.

Certificates of the University of Cambridge.

Allison, Henry ....Birmingham.
Brookes, Joseph .....Northwich.
Hitchcock, Thomas Frederic ...York.
King, Lawrence Bowdler .....Turnham Green.
Miller, Edwin Frederick.....Ipswich.
Parry, John .....Llangefni.
Peck, Ernest Saville .....Cambridge.

Certificate of the University of Glasgow.

Neill, William .....Govan.

Certificate of the University of London.

Want, William Phillip.....Lee.

Certificates of the University of Oxford.

Pinch, Albert Edwin .....Bath.
Smith, Arthur .....Watford.

Provincial Transactions.

SHEFFIELD PHARMACEUTICAL AND CHEMICAL SOCIETY.

Pharmacopœia Revision.

At a meeting of the Council of this Society the memorandum of the Medical Council was duly discussed. It was resolved that in acknowledging the courtesy displayed in the communication, the Council desired to state that it would do its utmost to render every assistance in its power towards suggesting improvements and giving information to the Committee for the revision of the British Pharmacopœia. But the Council wished to record its desire that any such information may be allowed to be transmitted through the Pharmaceutical Society, its representative head.

EDINBURGH CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

CHLORAL.*

BY W. PIRIE.

Chloral, like chloroform, was for many years on the shelf of the chemist's laboratory before its medicinal properties were known. It was discovered by Liebig in 1829 or 1830 (though not published till 1832) and for thirty-six years was looked on as merely a chemical curiosity; but in the year 1868 Dr. Otto Liebreich, of Berlin, discovered that when administered internally chloral produced hypnotic effects on the animal organism. Making some experiments, the doctor communicated the result of these to the Medical Society of Berlin, in June, 1869. The new remedy at once received attention. It was introduced for the first time into English medical practice as a soother of pain and producer of sleep in August, 1869. Nine years later it was calculated that upwards of fifty tons of chloral had been manufactured, or sufficient for some 36,000,000 doses.

Regarding the process for the manufacture of chloral, I presume all are acquainted with the bare outline given in the B.P. "Chloral, produced by the action of dry chlorine gas on anhydrous alcohol, purified by treatment, first with sulphuric acid and afterwards with a small quantity of lime." Our Pharmacopœia, however,

* Read at a meeting of the Edinburgh Chemists' Assistants and Apprentices' Association, March 7, 1883.

leaves us with but a crude notion of the preparation of chloral.

The following is the process as described by the discoverer, Liebig:—

"Chlorine gas is passed through absolute alcohol, which is kept cool at first, but afterwards raised to a continually increasing temperature, as long as hydrochloric acid continues to form; the resulting hydrate of chloral is freed from water and a small quantity of alcohol by agitation with oil of vitriol, and the decanted liquid rectified over lime. The chlorine is evolved continuously from a large retort or flask; passed through a chloride of calcium tube to dry it, and then into a bent tube, the arms of which are short and parallel to each other, but somewhat oblique towards the middle, while that portion of the middle which is directed downwards and contains the alcohol is wide, long and somewhat slating, so that the chlorine after arriving at the lowest part, is obliged to pass through the oblique column of alcohol; from this the unabsorbed chlorine, together with hydrochloric acid gas and vapour of hydrochloric ether, passes into two Woulfe's bottles and thence into the open air, so that the operator is not annoyed by it. At the commencement of the operation the alcohol is cooled by effusion of cold water, to prevent it from taking fire and depositing soot; but afterwards when the absorption of the chlorine diminishes, and the liquid assumes a yellow colour, it must be gradually heated and ultimately to the boiling point. Eight ounces of alcohol require the passage of the chlorine to be continued for twenty days, involving a consumption of 20 pounds of chlorine mixture. The alcohol becomes continually thicker, acquires a higher boiling point and is finally converted into a heavy syrup, which, after standing for some days, solidifies completely to a white crystalline mass, consisting of hydrate of chloral, together with a small quantity of hydrochloric acid and undecomposed alcohol." But how can we tell if enough chlorine has been passed into the alcohol, without having to wait for some days for the solidifying of this mass? "If a small sample of the liquid, after being agitated with four times its volume of oil of vitriol and set aside, does not in a few hours form an insoluble stratum (which is an insoluble form of chloral) above the oil of vitriol, enough chlorine has not been passed through the alcohol and of course it is necessary to continue the passage of the chlorine for a longer time. The solidified crystalline mass is heated till it melts; briskly agitated with four or six times its volume of oil of vitriol, which does not heat or blacken it, left at rest till the dehydrated chloral has risen to the top of the oil of vitriol, a result which may be accelerated by heating, and the transparent film of chloral immediately decanted by means of a pipette. If the oil of vitriol contains rather more than one atom of water it is particularly necessary to decant as quickly as possible, else the chloral will be converted into the insoluble variety. Lastly, the chloral is distilled over lime (which has been slaked and subsequently ignited) to remove hydrochloric acid, care being taken to keep the whole of the lime below the surface of the liquid, otherwise the lime will decompose the vapour and become red hot. In this manner the chloral is obtained tolerably pure, but it still contains traces of water and alcohol which may be removed by repeated treatment with oil of vitriol, the chloral being each time rectified over lime. All these operations must be performed in well-closed vessels." Such are the elaborate, though at the same time essential, details given by Liebig.

Regarding the rectification of chloral from lime, Dumas recommends a slight modification. He uses a saturated solution of common salt as well as the lime. The saturated solution of salt covers the lime and thus the vapour of chloral cannot be "fired" by coming into contact with it. True, a little hydrate remains behind, but he assures us that the distillate consists of pure chloral.

Gmelin informs us that hydrate of chloral may be obtained by saturating absolute alcohol with hydrochloric acid gas and then distilling this with black oxide of manganese and strong hydrochloric acid; or by distilling 3 parts absolute alcohol with 46 parts oil of vitriol, 32 parts common salt, and 24 parts manganese oxide. This process, however, does not appear to be advantageous.

To prepare chloral, Städeler very ingeniously does away with the use of alcohol altogether. Instead he uses either starch or sugar. One part of starch (or sugar) is added to 7 parts of commercial hydrochloric acid, which must be as free as possible from sulphurous acid. An equal volume of water is added, and the mixture gently warmed until the paste (formed when starch is used) has become liquid. This liquid when cold is introduced into a capacious flask. Three parts of manganese and a small quantity of common salt are then added (the salt is used to fix the sulphuric acid produced from the sulphurous acid in the commercial hydrochloric acid). The mixture is heated as quickly as possible to the boiling point, and then the fire is completely removed.

The mass swells up giving off a large quantity of carbonic acid, and continues to boil for some time by itself. As soon as the ebullition slackens it is kept up by fresh application of heat, and the distillate collected so long as it becomes turbid when mixed with a tolerable solution of potash. The turbidity is due to the separation of chloroform from the chloral. More hydrochloric acid is then repeatedly introduced into the flask by small portions at a time, till the distillate no longer smells of chloral or becomes turbid with the solution of potash.

The watery distillate is carefully freed from the colourless oil drops, which have been produced at the beginning of the distillation and which are heavier than water and smell strongly of chloroform. It is then saturated with common salt, in order to raise its boiling point and retain the water, distilled again and the resulting distillate freed from a sulphur-yellow very pungent smelling oil. It is then distilled several times more with common salt, removing the oily drops, in order to obtain aqueous chloral as concentrated as possible, and as free as possible from the yellow oil, which greatly impedes the purification of the chloral and thereby occasions loss. To facilitate the removal of this oil the distillate, before each successive distillation, is supersaturated with powdered chalk, which, during the boiling, decomposes a portion of the oil, but not the chloral. The concentrated chloral solution, however, always remains yellowish through oil remaining in it, and becomes turbid when mixed with a small quantity of water, but regains its transparency on heating or by mixing with more water. The concentrated solution is supersaturated with dry chloride of calcium and distilled in the oil-bath at 120°, whereupon the hydrate of chloral passes over as a colourless liquid, which soon solidifies, and consequently may stop up the neck of the retort, unless it be kept warm. By-and-by the liquid distilling over, instead of being colourless, becomes a yellowish or brown colour, arising from the presence of a peculiar oil which passes over in oily drops simultaneously with the water. The resulting hydrate of chloral is mixed with four times its bulk of oil of vitriol and gently warmed. The chloral rises to the surface in a colourless layer whilst the oil becomes heated and blackened with the evolution of hydrochloric acid gas. The stratum of chloral, after being removed by a pipette, retains only a small quantity of hydrochloric acid, to free it from which it is boiled for a while by itself, and then rectified over a small quantity of oil of vitriol and finally over lime. This is Städeler's process; a very troublesome one, indeed.

Such are the earlier processes for the preparation of chloral. As carried on on the large scale the manufacture may be briefly described thus:—Into thirty or forty glass carboys, each containing from 108 to 144lbs. of alcohol of 98 per cent., a copious stream of chlorine (washed and dried by sulphuric acid) is passed thorough for twelve or fourteen days. The carboys are, of course, kept cool at first, then gradually heated. As soon as the

specific gravity of the contents reaches 1·400 chlorination is stopped. The chlorinated alcohol is transferred to copper stills, lined with lead, and carefully boiled with an equal weight of sulphuric acid. Large quantities of ethyl chloride and hydrochloric acid gas are at first evolved. These with a whole series of valuable bye-products are condensed. After a while chloral distils over at a temperature of 94° C. When the temperature rises to 100° C. distillation is stopped. The distillate is neutralized with chalk and redistilled, the product being pure chloral.

The chemical reactions attending the production of chloral are very complex. During the chlorination step of the process we have formed aldehyde, acetal, trichloracetal, chloral alcoholate and ethyl chloride. Most of the ethyl chloride is converted into ether, then, step by step, into mono-, bi-, tri- and finally tetra-chlorinated ether. At this stage the liquid containing chloral alcoholate and tetra-chlorinated ether assumes the specific gravity 1·400 and the chlorination is stopped. If the chlorination were continued a penta-chlorinated ether would be formed which by distillation with sulphuric acid does not yield chloral.

During the distillation with sulphuric acid the chloral alcoholate splits up into chloral, water and ethyl sulphuric acid, while the tetra-chlorinated ether decomposes into chloral, hydrochloric acid gas and ethyl sulphuric acid. This ethyl sulphuric acid reacts with the hydrochloric acid gas, forming sulphuric acid and the ethyl chloride, which distils over in large quantity before the chloral.

Chloral is a thin colourless oily liquid, specific gravity 1·5439 at 0° C., while at 18° C., or about ordinary atmospheric temperature, the specific gravity is 1·502. It boils at 94·4 C. and may be distilled without change. Vapour density = 5·13. Chloral has a peculiar pungent odour and excites a copious flow of tears; has a greasy and slightly astringent taste; is also greasy to the touch and dropped on paper makes grease spots which, however, are not permanent. It acts very strongly on the skin, especially when its boiling vapour comes in contact therewith. It has no acid reaction even when dissolved in water; neither does it precipitate a solution of silver. Chloral, perfectly pure, when kept for some time in a closed vessel, gradually becomes turbid and deposits white flakes of insoluble chloral. This change will occur in a few days should the chloral be not quite pure. This insoluble chloral is also formed if chloral is allowed to stand for some time over sulphuric acid containing more than 1 atom of water. This insoluble modification will not dissolve in cold water and is only sparingly soluble in boiling water. It is insoluble in alcohol and ether, even at the boiling point. Chloral, on the other hand, is freely soluble in water, alcohol and ether. Chloral readily dissolves phosphorus, sulphur, iodine and bromine, and also absorbs a small quantity of chlorine gas, acquiring a yellow tint.

Anhydrous metallic oxides, such as baryta, strontia, lime, cupric oxide, mercuric oxide and peroxide of manganese, when heated in chloral vapour to only 100° C. become red hot and are converted with evolution of carbonic oxide gas into a metallic chloride, mixed with finely divided charcoal. Caustic alkalies also decompose chloral even at ordinary temperatures. The chloral is converted into chloroform, a formiate being formed.

The Compounds of Chloral.—Of the compounds of chloral the principal are the hydrate and alcoholate. There are, however, also a sulphide, a mercaptide, and a cyanate. Then there are combinations with aniline, toluidine, xylidin, and so on. In fact, new combinations are being formed every year.

Chloral Hydrate.—Chloral, shaken up with a small quantity of water, combines with it immediately, causing evolution of heat. In a few seconds it solidifies into a white opaque crystalline mass; this is the hydrate. Dissolved in water, and evaporated slowly to crystallizing, rhombic crystals are formed. Chloral hydrate melts at 46° and distils at 96° to 98°. It does not deliquesce on exposure to air. It has a pungent, but not acrid odour, and a pungent, but not acrid taste. On the application of a gentle heat it fuses to a colourless transparent liquid which, as it cools, begins to solidify at a temperature of 120° F.

It boils in a test tube with pieces of broken glass immersed in it at about 96° C. (evidence of due hydration), and at a slightly higher temperature it volatilizes on platinum foil without residue. It is soluble in less than its own weight of distilled water, rectified spirit or ether, and in four times its weight of chloroform. The aqueous solution is neutral or but slightly acid to test papers. A solution in chloroform when mixed by agitation with sulphuric acid does not impart colour to the acid. One hundred grains dissolved in 1 ounce distilled water and mixed with 30 grains of slaked lime submitted to careful distillation with a suitable apparatus should yield not less than 70 grains of chloroform.

From the new edition of the United States Pharmacopœia we learn that chloral hydrate is soluble in glycerine, benzol, benzine, bisulphide of carbon, and fixed and volatile oils. It also liquefies when mixed with carbolic acid or camphor. An aqueous solution soon becomes acid, but an alcoholic solution remains normal. Absence of alcoholate is confirmed by dissolving 1 grain in 2 c.c. of distilled water, warming and adding about 8 c.c. or a slight excess of a 5 per cent. test solution of caustic potash. This mixture is filtered and treated with a test solution of iodine until yellowish, when no yellow crystalline precipitate (iodoform) should appear, even after standing for half a hour. Before laying aside the United States Pharmacopœia I cannot help remarking that, from a student's point of view, it possesses a decided advantage over our own, for it explains why such and such a test is applied.

From these tests we would infer that the alcoholate is sometimes substituted for the hydrate, and such may be actually the case. Nor would the reason be far to seek, for the formula of the alcoholate being $C_2HCl_3 \left\{ \begin{matrix} OC_2H_5 \\ OH \end{matrix} \right.$ and that of the hydrate $C_2HCl_3 \left\{ \begin{matrix} OH \\ OH \end{matrix} \right.$ the molecular weight of the alcoholate exceeds that of the hydrate by 28. By calculation we find that the excess is to the amount of 17·25 per cent., meaning, of course, a gain to the manufacturer if he can sell it for hydrate.

Now chloral hydrate has sometimes been put down as impure, through the presence of hydrochloric acid, because if a stirring rod wet with liq. ammoniæ be held over the bottle containing the hydrate, white fumes are observed. Now this results from a different cause altogether. Chloral hydrate is volatile at any but very low temperatures and, of course, when we open a bottle volatilization goes on, though we do not see it, but on bringing ammonia to the mouth of the bottle, a formiate of ammonia in the form of a white cloud is produced. This may be proved by absorbing vapour of chloral hydrate with blotting paper, saturated with a solution of ammonia and testing for the formiate in the usual way. Wash the paper with distilled water, heat to evaporate the excess of ammonia, add solution of $AgNO_3$ and heat. The mixture becomes cloudy, blackens, and a silver mirror is deposited on the sides and bottom of the vessel.

Commercial chloral hydrate varies in consistency. Some of it is soft and easy to crumble. Other samples are hard and solid. The cause of this is the degree of hydration. The softer variety is saturated with a slight excess of water, while the harder contains a little free chloral. The latter has an advantage over the former in dispensing, and contact with moisture immediately converts the minute quantity of free chloral into hydrate. Lately, however, brilliant pellucid rhombohedra have been produced by crystallizing from boiling chloroform, and they are much more capable of resisting change by contact with air than the common variety.

Chloral hydrate is sometimes used to detect the English, French and German peppermint oils. Its power of doing so became known in this curious fashion. Dr. C. Jehn had stated that peppermint oils were coloured by chloral hydrate. This statement was afterwards contradicted by Professor Flückiger and Dr. Hager. Dr. Jehn re-experimented and found that chloral hydrate gives with French peppermint oil, a red colour; with German oil, a pale brown colour; and with English oil, hardly any colour.

Chloral Alcoholate.—This is prepared by mixing chloral with absolute alcohol. The formula is $C_2HCl_3 \begin{cases} OC_2H_5. \\ OH. \end{cases}$ This is a crystalline body melting at 56° C. and boiling at 114°–115° C. It is decomposed by strong sulphuric acid with reproduction of chloral. It is easily soluble in alcohol, ether, acetic ether and petroleum, and on cooling, a hot concentrated solution crystallizes out in long beautiful needles. They have much the smell and taste of the hydrate, but dissolve less easily in water. Heated with 2 volumes of water, the alcoholate melts at the bottom of the tube and solidifies again on cooling. (The hydrate would dissolve.) Treated with sulphuric acid the liquid becomes brown; hydrate would not. Lastly, if the alcoholate be warmed in nitric acid of specific gravity 1·2, violent reaction ensues with evolution of nitrous acid; hydrate treated in this way gives, at the most, a very small quantity of yellowish vapour.

There is a pretty experiment which is almost distinctive betwcen the alcoholate and the hydrate. A glass is filled with water. A few crystals are dropped into it. If the salt is the hydrate, it will sink at once and dissolve, with, perhaps, the exception of one or two minute flakes. If the salt be the alcoholate, only the large crystals will sink to the bottom and lie there some time before they gradually disappear; but small crystals or fragments of crystals will float on the surface of the water, and in a second or two they will become, apparently, imparted with life. They begin to spin round and round and dart from one side of the vessel to the other. The sight is very amusing. Slightly tepid water makes their motions more rapid and jerking. The cause of the movements is the slight current of saline solution from each crystal sinking down.

Chloral Sulphydrate.—This body is prepared by passing dried sulphuretted hydrogen through anhydrous chloral. It is purified by crystallization either from anhydrous alcohol or ether. It crystallizes in white rhomboidal plates or four-sided right prisms. It has a disagreeable odour and a peculiar taste recalling that of the hydrate. It melts at 77° C. and boils at 123° C. Its vapour darkens paper, saturated with a solution of a soluble salt of lead. It is soluble in all proportions in anhydrous alcohol, ether and chloroform. In the presence of water the sulphydrate is slowly decomposed, with deposition of sulphur, formation of hydrogen sulphide which escapes, and hydrochloric acid and chloral which are found in the water. There is also deposited a small quantity of liquid which has the appearance of tetrachloride of carbon. It is certain that this decomposition in water is very complex, because part of the hydrogen sulphide reduces the chloral, as shown by the deposit of sulphur and formation of hydrochloric acid and carbon tetrachloride.

The formula of the sulphydrate is $C_2HCl_3 \begin{cases} OH. \\ SH. \end{cases}$

When aniline is mixed with chloral great heat is evolved and a thick liquid is formed. This becomes crystalline when it cools, and may be recrystallized from alcohol in fine tables with well developed faces. This body has basic properties and forms with perchloride of platinum golden coloured scales. It has the formula—

$$C_{14}H_{13}N_2Cl_3 \text{ or } CCl_3 - CH \begin{cases} NH - C_6H_5. \\ NH - C_6H_5. \end{cases}$$

The body is trichlorethylidine-diphenyldiamine.

When toluidine is mixed with chloral great heat is evolved and the compound becomes solid on cooling. This body, trichlorethylidine-ditolyldiamine, forms with acids salts of toluidine. It melts and is decomposed by water. Formula—

$$CCl_3 \begin{cases} OC_2H_5. \\ NHC_6H_4CH_3. \end{cases}$$

A compound of xylidine and chloral is also formed similar to the above—

$$CCl_3.CH \begin{cases} NH.C_6H_3(CH_3)_2. \\ NH.C_6H_3(CH_3)_2. \end{cases}$$

Now, having looked at our subject only as a chemical, let us deal with it in its application as a medicinal agent. Chloral hydrate is the compound invariably prescribed. As before stated, Liebreich was the first to point out the therapeutical importance of chloral. He had observed that chloral hydrate is decomposed by an alkali into chloroform and a formiate, and reasoned that if administered internally the alkali of the blood would have the same effect. To test the correctness of the theory he administered chloral hydrate to some rabbits and found that it produced sound sleep. He administered a dose of 17 grains to a lunatic. The result was a sleep of five hours. Another dose of 44 grains was given. This dose produced a sleep lasting for the rather alarming period of sixteen hours. From these experiments Liebreich inferred that his theory of the decomposition of chloral hydrate into chloroform was correct. However, the theory has been experimentally proved to be untenable. Chloral does not produce the distinct anæsthetic effects of chloroform. Animals under the influence of chloroform exhale chloroform from the lungs, while in the excreta and blood chloroform is readily detected. Animals under the influence of chloral hydrate exhale chloral from the lungs and chloroform is not found in their excreta or blood. Messrs. Mering and Muscullen made some experiments to disprove Liebreich's theory, and in examining the urine of persons who had taken for some time doses of 5 or 6 grains of chloral hydrate every night, discovered neither chloroform nor formic acid, but a trace of chloral. They also found a substance which reduced Fehling's solution and turned the plane of polarization to the left. They isolated this substance and obtained it in stellar groups of colourless silky crystals, having the properties of an acid. It was readily soluble in water, alcohol, and a mixture of alcohol and ether, but insoluble in pure ether. Ultimate analysis of the acid and examination of its barium and potassium salts led to the formula $C_7H_{12}Cl_2O_6$. This substance they named uro-chloralic acid. From the discovery of this body it would appear that chloral hydrate belongs to those bodies which, like benzoic acid, combine with some product of the organism and are eliminated in this condition.

When administered internally chloral acts as a hypnotic, sedative and antispasmodic. The B.P. dose is 5 to 30 grains. Fifty grains have proved fatal, while on the other hand 460 grains have been given without any alarming results. The person who received this large dose was addicted to excessive drinking and in such subjects large doses of chloral seem to be tolerated. Dr. Richardson, from experiments, concludes that an average adult man can only use up 7 grains of chloral hydrate per hour, so that we should bear in mind not to dispense a prescription ordering more than 140 or 160 grains per twenty-four hours without making inquiries, else accumulative poisoning may result.

As a remedy, chloral has become so popular that its range of application is as diversified as any drug or chemical of a century's standing. In proof of this we find our pharmaceutical liturature teeming with formulæ for the preparation of elixirs, cough mixtures, liniments, ointments, plasters, suppositories, caustic pencils, capsules, etc., all containing chloral.

Allow me to call special attention to one of these preparations,—the liniment of camphor and chloral. On mixing equal parts of chloral hydrate and camphor there

is formed an oily liquid which smells of chloral and tastes of camphor. When ignited it burns with a white flame having an emerald green edge; is readily soluble in alcohol, ether and olive oil; treated with water it is converted into a soft translucent mass, from which, after some time, the chloral hydrate appears to be dissolved out, leaving the camphor in crystalline grains Mixed with 1½ parts of chloroform the mixture remains clear, but a further addition of 3 parts renders it turbid. By careful distillation I was able to separate the chloral from the camphor.

Why does a mixture of chloral and camphor liquefy? Does the chloral dissolve the camphor or the camphor dissolve the chloral? Is the resulting liquid a mere solution or a chemical compound? I mixed 2 parts of chloral with 1 part of camphor and obtained a liquid. Then I made another mixture in inverse proportions, 2 parts of camphor and 1 part of chloral. I placed this mixture in a phial and put it in my trousers pocket. I carried it there for some hours, during which time of course it was submitted to a gentle heat. When I looked at this mixture it was liquid also. I placed it aside. Next time I examined it, I found it had become a soft crystalline mass. I had got thus far when my attention was directed to the following simple experiment by Saunders, which appears in the 'Year-Book of Pharmacy' for 1877:—"A lump of camphor and a lump of chloral hydrate were placed on a flat plate about an inch apart from each other. They were covered by a bell jar. In fifteen minutes the surface of the camphor was damp, while the chloral hydrate remained dry. In three hours the camphor was wet and standing in liquid, while the chloral hydrate remained still dry. In twelve hours the liquid had reached the chloral, the upper surface of which was still dry. In twenty hours both the chloral and camphor were half liquefied and the inner surface of the bell jar covered with moisture."

This experiment seems almost to point out that the vapour of chloral was the solvent; but 1 part of camphor forms a permanent liquid with 3½ parts of chloral, while 1 part of chloral dissolves, with heat, 2 parts of camphor and solidifies on cooling, owing to camphor crystallizing out. It is probable that camphor is the solvent. Before quitting the subject I may state that a slight rise of temperature, 3° F., has been observed on mixing chloral and camphor together, and Messrs Cazeneuve and Imbert conclude that the liquid formed is an unstable molecular compound, similar to the combinations of camphor with alcohol, acetic acid and nitric acid.

With regard to making an ointment of chloral hydrate, chloral hydrate liquefies solid fats, so that if we were to mix it with lard or simple ointment our product would be far too soft. A little spermaceti must be added to give the ointment consistency. Then, again, in making suppositories we generally use oil of theobroma as an excipient. Try it as an excipient for chloral hydrate and we get a fine unctuous mass. In fact we must use something like equal parts of oil of theobroma and spermaceti to make a good suppository.

About 1874 Dr. Kean discovered that chloral hydrate possessed remarkable antiseptic powers, and in these rooms, March, 1876, Dr. Craig, of the Edinburgh School of Medicine, communicated a paper to the North British Branch giving the results of some experiments he made in this direction. As an antiseptic in treatment of wounds, ulcers, etc., he employed chloral hydrate with great success. He also used it in the dissecting room, for the preservation of anatomical specimens, with good results. Employing a solution of from 1 to 1½ grains per ounce, he found it an excellent preservative for vegetable specimens, and showed leaves, fruits and flowers, which had been preserved for sixteen months. Thus chloral hydrate would be very useful in that we could have a fresh plant sent from a distant country in such a condition that it could be minutely examined by a botanist.

Chloral hydrate is the best antidote for strychnine, when promptly given, arresting both the force and frequency of the tetanic convulsions. Conversely, strychnine is an antidote to chloral hydrate.

Chloral is also antagonistic to calabar bean; but to act as an effectual antidote the slower acting chloral must be given within two minutes after the quicker acting calabar bean.

With regard to the medicinal properties of any of the other compounds of chloral, I have been unable to obtain any information. The only hint that any one of them had ever been tried was that the alcoholate seems to differ essentially from the hydrate in its physiological effects.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

A meeting of this Society was held on Thursday, June 7, Dr. W. H. Perkin, F.R.S., President, in the chair.

The following certificates were read for the first time:—J. T. Barr, L. L. Garbutt, C. W. Stephens, P. H. Wright.

The President expressed his regret that a sufficient number of Fellows were not present to enable a ballot to take place; he hoped that a ballot would be held at the next meeting, on June 21, which would be the last meeting of the session.

Dr. Gladstone then communicated—

Laboratory Notes. By J. H. Gladstone and A. Tribe.—1. *On the Action of Light and Heat on Cane and Invert Sugars.*—The authors have investigated the action of their well-known copper-zinc couple on a 5 per cent. solution of sugar. No carbonic acid was evolved at ordinary temperatures, but at 100° C. carbonic acid was formed, and a small quantity of a substance which gave the iodoform reaction on treatment with iodine and potassium hydrate; this substance also gave acetic acid on treatment with potassium chromate and sulphuric acid. It was, therefore, thought at first that alcohol had been produced from sugar. Further investigations showed that the carbonic acid came from some oxycarbonate of zinc formed during the working of the couple, while the reducing body was a product of the action of heat upon the sugar solution. Many experiments were made in which a 5 per cent. solution of cane sugar was heated for many days, in all cases the iodoform-yielding substance was formed even in the absence of air. Some experiments were also made as to the influence of light, air, atmospheric germs on the conversion of cane sugar into glucose. The authors conclude that this conversion takes place with extreme slowness, when the cane sugar solution is exposed to the action of light and air, singly or jointly. Light appears to be detrimental to the development of fungoid growths in a solution of cane sugar exposed to atmospheric air. 2. *On Hydroxylamine.*—The copper-zinc couple reduces the hydrochloride of this base, ammonia being formed. 3. *On the Recovery of Iodine from Organic Iodide Residues.*—The residues are poured on an excess of copper-zinc couple wet with water or alcohol; zinc iodide is formed, which is extracted with hot water. The iodine is obtained in the free state by the action of hydrochloric acid and bleaching powder. 4. *A Residual Phenomenon of the Electrolysis of Oil of Vitriol.*—It was noticed that gas continued to be evolved from both the electrodes after the battery had been disconnected, this gas was oxygen. This phenomenon is probably due to the presence of Berthelot's persulphuric acid. 5. *On an Alleged Test for Alcohol.*—Davy suggests that traces of alcohol can be detected by the blue colour which is produced with a warm solution of molybdic anhydride in oil of vitriol. The authors find that many other reducing substances and sugar give the same reaction. 6. *Reaction of the Copper-zinc Couple on Nitric Oxide.*—When this gas is passed over the moist copper-zinc

couple ammonia, but no protoxide of nitrogen, is formed. Free nitrogen was substituted for nitric oxide, but no evidence as to the formation of ammonia could be obtained. 7. *On the Reducing Action of Spongy Lead.*—Spongy lead, free from occluded hydrogen, reduces nitrates to nitrites, ammonia being simultaneously formed. This spongy lead has no action upon an aqueous solution of potassium chlorate, but the addition of 1 per cent. sulphuric acid causes a slow reduction to chloride. Lead filings cause similar reactions, but their activity is much less.

Mr. Warington said the fact recorded by the authors, that sugar solution when heated forms a reducing substance giving the iodoform reaction, was of great importance, and moreover threw some doubt on the conclusions drawn by Muntz, as to the occurrence of alcohol in almost all natural waters, these conclusions depending on the iodoform reaction.

The Secretary then read the following—

Note on a Basic Ammonia Copper Sulphate. By S. U. Pickering.—The author stated in a previous paper (*Chem. News*, xlvii., 182) that on dilution, ammoniocopper sulphate solution throws down a basic precipitate containing only traces of ammonia. With strong solutions, however, different results are obtained; with nearly saturated solutions a violet-blue substance is slowly deposited, which has the composition $4CuO,5SO_4$ $16NH_3$. When such a solution is diluted with a small quantity of water a violet-blue precipitate $CuSO_4$ $3CuO$ $2NH_3$ $5H_2O$ is deposited.

Notes on Loew and Bokorny's Researches on the Probable Aldehydic Nature of Albumin. By A. B. Griffiths.—The author states that he has gone over a good portion of the experiments which led the above chemists to their conclusions, and in the present paper details one or two observations he has noticed in the case of the protoplasm of spirogyra. The protoplasm, whether dead or alive, reduces a dilute alkaline solution of a cupric salt. The living cells when treated with a weak solution of sodium chloride under the microscope form crystals. The author is, therefore, inclined to think that the reducing body is a glucose and, moreover, it must be dextrose, because levulose does not form a crystalline compound with sodium chloride. The author does not give any analysis or say how the crystals were identified, but states that most likely they have the formula—

$$C_6H_{12}O_6NaCl,H_2O.$$

Note on the Action of Sulphuric Acid, Specific Gravity 1·84, upon Potassium Iodide. By H. Jackson.—It has long been known that when strong sulphuric acid acts upon potassium iodide, there are produced hydric sulphide, sulphur dioxide, iodine, hydriodic acid, hydropotassic sulphate and water; but no details as to the amounts produced have been published. The author finds that two principal reactions occur. The first when the sulphuric acid is in large excess, when the reaction is—

$$2KI + 3H_2SO_4 = I_2 + SO_2 + 2HKSO_4 + 2H_2O$$

the second when there is just sufficient sulphuric acid to satisfy the potassium iodide used.

$$8KI + 9H_2SO_4 = I_8 + H_2S + 8KHSO_4 + 4H_2O.$$

To obtain these reactions perfectly it is necessary to have the sulphuric acid boiling. The analytical numbers are given upon which the above reactions are founded.

Dr. Debus said the reaction was interesting, as in the second equation the hydriodic acid first evolved reduced the sulphuric acid, hydric sulphide being formed. Under certain conditions hydric sulphide was obtained from the action of zinc upon sulphuric acid, the nascent hydrogen reducing the sulphuric acid. In both cases the sulphur changed its valency.

The Action of Nitrous Anhydride on Glycerine. By O. Masson.—The author employed the pure glycerine of commerce and generated the nitrous anhydride by the action of nitric acid sp. gr. 1·35 on "porcelain arsenic." The gas was dried over fused calcium chloride and then passed direct into the glycerine. The reaction takes place quietly, the glycerine greatly increases in bulk and mobility; its colour changes through yellow to brown, finally becoming dark green. Two layers of liquid form, an aqueous solution of nitrous acid and of oxidation products of glycerine, and a layer which consists of the nitrous ether of glyceryl. These layers react upon each other and should therefore be separated as soon as possible. By passing a rapid current of dry hydrogen the author succeeded in distilling the ether at 100°, or 50° below its boiling point. Analysis indicated the formula $C_3H_5(NO_2)_3$. The liquid was distilled several times; it is amber coloured; boils with decomposition at 150°; burns with a whitish flame, but does not explode under the hammer. It does not mix with water, but the ether is decomposed at the surface of contact. It cannot be preserved pure; when enclosed in sealed tubes it produces pressure enough to shatter the glass.

Parliamentary and Law Proceedings.

The Pharmaceutical Society of Great Britain *v.* Copley.

At the Nottingham County Court, on Friday, the 15th inst., before S. B. Bristowe, Esq., Q.C., judge, the Council of the Pharmaceutical Society of Great Britain sued Mr. J. C. Copley, who carries on business at 51, Robin Hood Street, Nottingham, for the recovery of a penalty of £5 under the 15th section of the Pharmacy Act, 1868.

Mr. E. R. Turton, barrister, instructed by Messrs. Flux, Son and Co., appeared for the Society.

Mr. Barrows appeared for the defendant.

Mr. Turton said the action was brought under the 15th section of the Pharmacy Act, 1868. Contrary to the provisions of that section the defendant had kept an open shop for the retailing, dispensing or compounding of poisons, he not being a duly registered person. Mr. Turton then referred to the various sections of the Act bearing upon the case, and stated that it appeared that on May 12 last, Mr. Stroud went into the defendant's shop and purchased some laudanum, and the bottle was wrapped up in a handbill setting forth the defendant's name and qualifications. As he understood that Mr. Barrows admitted those facts, and that the defendant was the proprietor of the shop where the poison was bought, he submitted that the defendant had kept open shop for the sale of poison, and was, therefore, liable for the penalty sued for, and with those facts he left Mr. Barrows to show that the Act did not apply in the present case.

Mr. Barrows intimated that he admitted that the laudanum was sold in defendant's shop; he preferred to call witnesses before addressing the Court.

The defendant was called and said that he had in his employ Henry Edward Wakefield, a registered chemist; he had not sold poison in his shop, nor had he allowed any to be sold. He was an analytical chemist. He had authorized his assistant to sell poisons on his own account, but he had said that if he (Wakefield) liked to sell poisons at his own risk and with his own capital he could do so.

In reply to the Judge, defendant said that he was well acquainted with medical and pharmaceutical chemistry, and was a member of several learned societies.

Mr. Barrows: You prepare gentlemen to pass the examinations of the Pharmaceutical Society?—Yes, I do.

Mr. Turton: And you have failed to pass yourself?—Yes.

H. E. Wakefield was called and stated that he sold the laudanum at his own risk, the defendant did not share the profit. He was a duly registered chemist.

Mr. Barrows contended that the action was under a penal statute, and, therefore, it ought to be construed most strictly and not by inference.

His Honour pointed out that the section said "any person who shall sell or keep an open shop for the retailing, etc."

Mr. Barrows submitted that defendant kept an open shop for the sale of pharmaceutical preparations, but not an open shop for the sale of poisons. He referred his Honour to reported cases, and said that the Act was passed for the protection of the public, and submitted that the public had in no way been injured.

His Honour said the plaintiffs had made out their case and gave judgment, the penalty of £5 and costs.

Mr. Barrows asked for leave to appeal.

His Honour said it was a matter of some interest, and if he thought it desirable he would not refuse the request, but Mr. Barrows had better consider the matter.

The Pharmaceutical Society of Great Britain *v.* Brown.

At the same Court the Council of the Pharmaceutical Society sued Mr. A. E. Brown, of 11, Sussex Street, Nottingham, to recover two penalties of £5 each under section 15 of the Pharmacy Act, 1868, one for keeping open shop for the sale of poison, not being a duly qualified person, and the second, for taking, using or exhibiting the title of "chemist."

Mr. Turton, barrister, instructed by Messrs. Flux, Son and Co., appeared for the Society.

Mr. Payne represented the defendant.

Henry Goodlud, of Nottingham, proved that on May 12 last he purchased two pennyworth of laudanum at defendant's shop. He produced the bottle in which it was contained, upon which defendant had placed a label bearing his name and address and the title "chemist."

Mr. J. B. Coleman, Analyst and Demonstrator of Chemistry at the University College, Nottingham, proved that he had analysed the contents of the bottle produced by last witness. He found the contents to be a tincture of opium.

Mr. Payne admitted that the Act had not been conformed with, but said that defendant would at once enrol himself as a member of the Pharmaceutical Society if the case was adjourned.

His Honour gave judgment for the plaintiffs for the two penalties, £10 with costs.

Poisoning by Potassium Cyanide.

An adjourned inquest on the body of the late Mr. John Odlum, who died suddenly at his residence, Hove, on May 30, was held on the 6th instant, by Mr. Wynne E. Baxter, Coroner for East Sussex.

Medical evidence having been given to the effect that death had resulted from poisoning by potassium cyanide,—

Horace Arthur Costerton, of 90, Western Road, Brighton, chemist, knew the deceased as a customer for some time past. He had bought recently some cyanide of potassium. On May 7, he came to witness's shop in his absence and asked his assistant to serve him with some cyanide in order to clean some silver. The assistant refused in the absence of witness to serve him with the cyanide of potassium, but on the following day deceased came and asked witness personally for the cyanide. Witness, knowing him well, served him with an ounce, obtaining his signature, as usual, in the poison book. On May 10, the deceased returned, saying that he had used the ounce, but it was not quite sufficient for his purposes. He asked for a further small quantity, and he was served with another half ounce, his signature being again given. These were the only two cases of deceased's being supplied with poison by witness. He should say the cyanide of potassium in the bottle produced was, as dissolved in the water, less than an ounce.

The Jury, after a short discussion, returned a verdict to the effect "That the deceased committed suicide whilst in a state of temporary insanity."—*Sussex Daily News.*

Poisoning by Opium.—A Herbalist Censured.

On Friday, the 15th inst., the Leicester Borough Coroner, Mr. G. F. Harrison, held an inquest relative to the death of Charles Hanger, aged 51 years. It appeared that deceased had been ailing, and his daughter sent for a herbalist, named Whitley, who brought some medicine which was given according to direction. The symptoms, however, increased, and a medical man subsequently came, death ensued shortly afterwards.

James Whitley, the herbalist, said that on Sunday morning he was requested to see the deceased, who was suffering from chronic bronchitis. Deceased had some powders in his house, which witness had made up previously, and he told him to take one. He then went home and made up a bottle of medicine, which he took to the house of the deceased. On Monday night deceased was so much recovered that he came down stairs. On Tuesday, upon visiting, he found him much worse. On Wednesday he seemed a little better, and told witness he should like something to make him sleep. Witness went to Mr. Cleaver, a chemist, and bought three grains of opium. He made two and a half grains of it into a pill, and sent it for the deceased. About 9.30 on Thursday morning he went to see the deceased, and found his breathing very much worse, and he recommended that a doctor should be called in. He did not see the deceased again. He had been in business as a herbalist for twenty-five years.

In reply to the Foreman, witness said he had administered as much as two and a half grains of opium before, where there had been symptoms of typhoid fever, and there was a good deal of fever to contend against in this case.

Mr. G. C. Franklin, surgeon, had examined the body, and was of opinion that death was caused by bronchitis and an overdose of opium.

The Jury returned a verdict to the effect that death had been caused by bronchitis and an overdose of opium, indiscreetly administered by the man Whitley. Whitley was then called in, and censured by the Coroner.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Deposits from Tinctures.

Sir,—As I am about to undertake the examination of deposits occurring in the B.P. tinctures, I should be glad if any readers would kindly forward me any which they may be able to obtain, with a label stating by what method the tinctures have been prepared.

17, *Bloomsbury Square, W.C.* R. A. Cripps.

J. Fingland.— (1) *C. pallescens*; (2 and 3) *C. panicea*; (4) *C. curta*; (5) *A. aquatilis*; (6 and 7) *C. vulgaris*; (8) *C. ampullacea*; (9) *C. teretiuscula*; (10) *C. fulva*; (11) *C. muricata*; (12) *C. hirta*. Please not to send more than six specimens at one time in future.

"*Crinis.*"—A solution of borax is sometimes used, but the condition is probably one requiring internal treatment rather than a local application.

"*Alpha.*"—The question is rather one for the opinion of medical men, who are by no means agreed as to the action of chrysophanic acid.

"*Salix.*"—*Salix fragilis*, probably; a twig bearing stipules should always be sent in the case of species of *Salix*.

R. A. Hoyle.—(1) *Eriophoron polystachion*; (2) *Luzula sylvatica*; (3) *Pogonatum juniperinum*; (4) *Luzula pilosa*; (5) *Melica uniflora*. The specimens sent previously were too fragmentary to name with certainty.

Communications, Letters, etc., have been received from Dr. G. Johnson, Dr. Senier, Messrs. P. Wells, Proctor, Jones, Junior Assistant.

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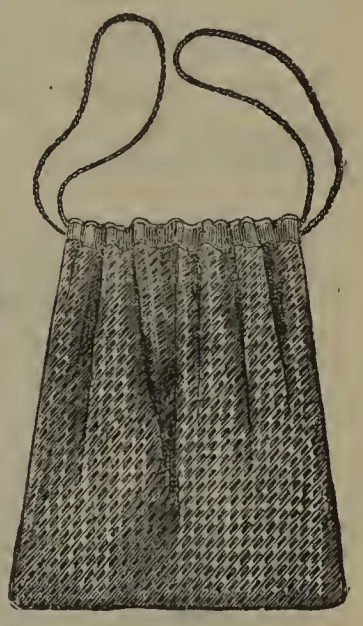

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FOURTEENTH SESSION, 1883-4.

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CONCILIO ET LABORE.

MANCHESTER COLLEGE OF PHARMACY

225, OXFORD STREET, MANCHESTER.

The next Session will begin on Monday, August 13th. The new Time Table, giving particulars of the Day, Afternoon and Evening Classes for the MINOR and PRELIMINARY is now ready.

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TERMS FOR ADVERTISEMENTS

IN THE

PHARMACEUTICAL JOURNAL.

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Advertisers are requested to observe :—

1.—That Advertisements are received at the Publishing Office (as below) not later than ten o'clock on Thursday morning, and they must be prepaid.

2.—That letters addressed to initials or to fictitious names at a Post Office are not taken in, but are at once sent back to the writers by the Post Office Authorities.

3.—That all letters respecting the insertion of Advertisements should be endorsed on the envelopes "**PHARM JOURN,**" and must be sent only to the Publishers.

Estimates for Advertisements, in Wide or Narrow Measure, for Single insertion or for Series, will be sent on application to the Publishers.

The Journal is supplied post free to any part of the United Kingdom, on prepayment of 20*s.* for twelve months; 10*s.* for six months; single copy 4½*d.* To the Colonies and Abroad, 22*s.* per annum.

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ENGAGEMENTS WANTED.

AS Druggist's PORTER. Wholesale or Retail. Situation by a married man with good character. Age 34. 8 years' experience. A. B., care of Mr. Bough, Millfield, Peterboro'.

BY a Dentist (registered), with a Chemist. If required can teach the process thoroughly. Good reference. Terms moderate. DENTIST, Mr. Roper, Fountain St., Ulverston.

AS LOCUM TENENS or MANAGER. In North or Midlands. First-class experience. Can Prescribe and Extract Teeth. Age 34. Height 5ft. 10in. Shortly disengaged. MINOR, 82, Rice Lane, Walton, Liverpool.

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ASSISTANTS WANTED.

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MESSRS. BEETHAM & SON, Cheltenham, require a thoroughly competent Junior ASSISTANT, about 22 years of age, who must have been accustomed to first-class Dispensing and select Retail. Applicants will please state reference, salary required, &c., and when at liberty. Also enclose carte (which will be returned).

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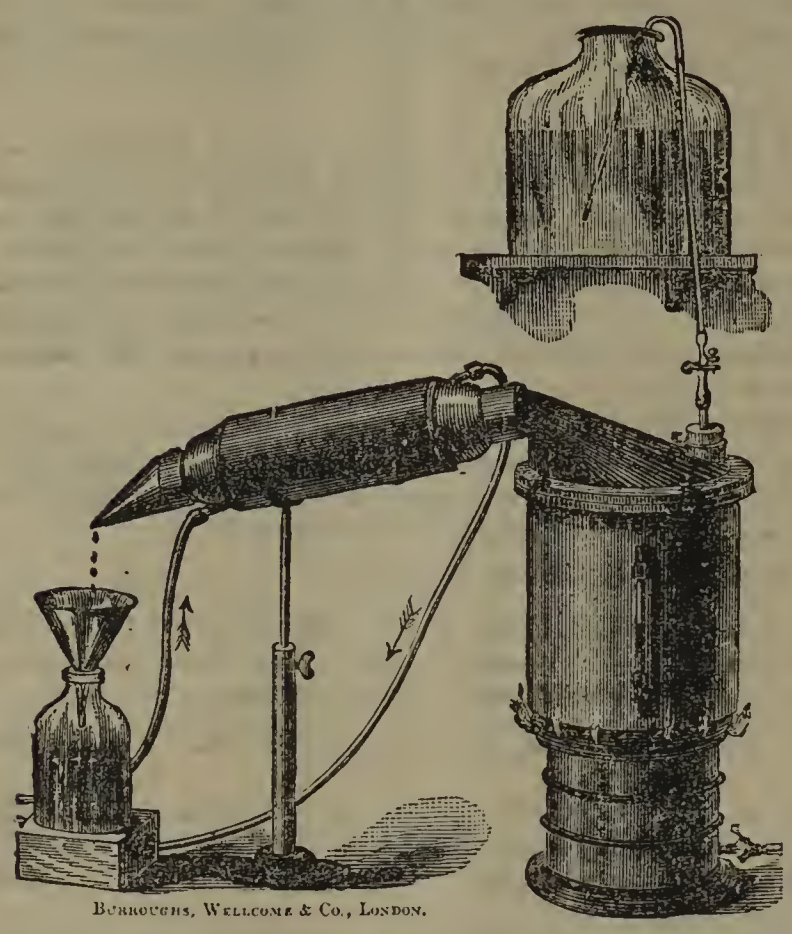

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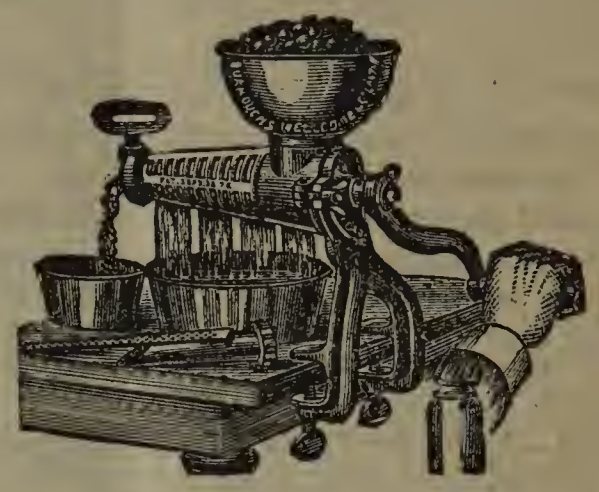

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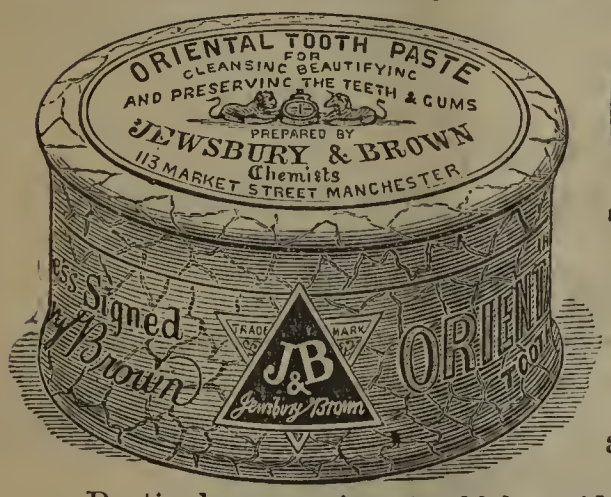

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CAUTION.—Circumstances which have come to the knowledge of Andreas Saxlehner, Buda Pest, Sole Proprietor of the Hunyadi János Spring, compel him to WARN the British Public against SPURIOUS IMITATIONS. To secure genuineness, purchasers should see that every bottle has on the LABEL the name of

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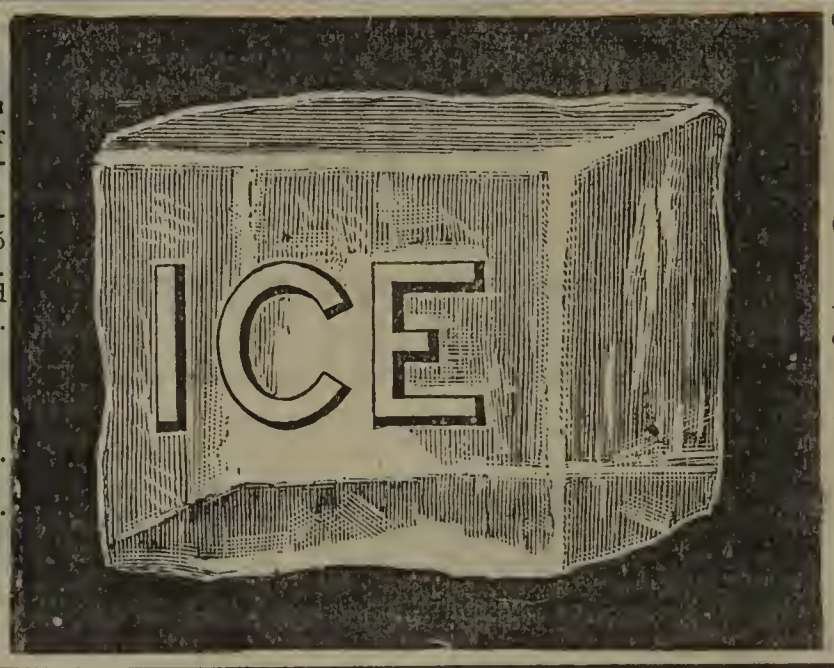
FOREIGN
MINERAL WATERS.

FREDERICKSHALL (5 Cases, 6d. per Case less), 28/- Case, 30 bots.; 39/- Case, 60 ½-bots.
APOLLINARIS, 25/- Case, 50 bots.; 39/- Hpr., 100 ½-bots. Hprs. free. 5 °/₀ discount if 20. Carriage paid.
HUNYADI JÁNOS (10 Cases, 3/- and 5/- less), 30/- Case, 25 bots.; 50s. Case, 50 ½-bots.

SELTZER ..	11/-	Hpr.,	25 bots.
,, ..	15/-	Hpr.,	50 ½-bots.
PULLNA ..	18/-	Case,	20 bots.
,, ..	30/-	Case,	50 ½-bots.
VICHY ..	31/-	,,	50 bots.
,, ...	27/-	,,	50 ½-bots.
CARLSBAD ..	37/-	,,	50 bots.
KISSENGEN ..	42/6	,,	50 ,,
SCHWALLBACH	27/6	,,	50 ,,
HOMBURG ..	40/-	,,	50 ,,
WILDUNGEN	43/-	,,	50 ,,



CARLSBAD SALTS, ¼-bots., 20/- per doz.; ½-bots., 40/- per doz.; bots., 80/- per doz.

NORWAY
BLOCK ICE.

Original Blocks, 2s. per Cwt.
Packing and Mats free.
Low quotations given for quantities taken from vessels while discharging.
PRINTED DIRECTIONS for STORING ICE sent free on application.

W. B. HARRISON,
IMPORTER of ICE and MINERAL WATERS,
6, Bridge St. Sunderland.

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A POSITIVE CURE
FOR
STOMACH, LIVER & KIDNEY AFFECTIONS.

The Only Palatable Natural Aperient Water.

THE BEST HOUSEHOLD REMEDY & SPECIFIC FOR CONSTIPATION

Highest Award at the International Medical Exhibition, 1881. Retail 1/6 & 2/- per Bottle.

A SUPPLY OF CIRCULARS WITH NAME AT FOOT AND DESCRIPTIVE PAMPHLETS FREE ON APPLICATION.

Chemists can safely stock this Water, as it will continue to be well advertised.
It is prescribed by all the leading Medical Men.

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KILNER BROS., Glass Bottle Manufacturers,

Solicit orders for MEDICAL DISPENSING BOTTLES (Green and White Flint) and other kinds used by Chemists.
Also for their new Feeders.

"OUR BABIES' BOTTLE."

(6d. Retail)
36s.
38s.
42s.
AND
44s.
per Gross.

(1s. Retail)
75s.
AND
81s.
per Gross.

(1s. 6d. Retail)
108s.
AND
120s.
per Gross.

Terms and Discounts forwarded on receipt of application stating quantity required. Large buyers liberally treated with. Illustrated Price Lists of all kinds of Bottles on application to KILNER BROTHERS, 10, Great Northern Goods Station, King's Cross, London.

BETTS & CO. LIMITED

(ESTABLISHED IN 1840),

SOLE MAKERS IN GREAT BRITAIN OF

METALLIC CAPSULES,

AND PATENTEES OF THE

Coloured Side Mark, Label, and other Speciality Capsules

(For the Prevention of Fraud and Refilling of Old Labelled Bottles)

As supplied to Bass & Co., and the leading Brewers and Bottlers of Wines and Spirits throughout Europe.

PLAIN ORDINARY CAPSULES,

For Small Phials, **2s. 6d.** and upwards per 1000, according to size, style, design, and quantity.

SPECIAL CONTRACTS FOR CONTINUOUS DEALING.

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PURE ENGLISH MADE BOTTLING AND PACKAGE TINFOIL

From **1s.** per lb., and upwards. **MIXED FOIL** (Foreign Quality), from **6d.** per lb. (according to gauge).

PATENT BARREL PACKAGES AND SNUFF CANISTERS, &c.

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PARIS:—Office, 4, Rue Mogador, Chausse D'Antin.
BOURDEAUX:—Office, 3, Quai de Chartrons; Factory, Monrepos, Floirac.

PATENTEES OF

Hydraulic and Mechanical Pressure Capsuling Machines,

ESPECIALLY ADAPTED FOR CHEMISTS' COUNTERS.

Largely in use by the Trade, and efficiency guaranteed for all sizes of Bottles, at Royalties from **5s.** to **£2 2s.** per annum.

LIEBIG COMPANY'S EXTRACT OF MEAT

The only brand warranted genuine by Baron Liebig.

CAUTION.—Numerous inferior and low-priced substitutes being in the market with misleading titles, labels and portraits of the late Baron Liebig, purchasers must insist upon having the Liebig Company's Extract of Meat.

N.B.—Genuine ONLY with facsimile of Baron Liebig's Signature, in blue ink, across label.

ALLEN & HANBURYS'

EFFERVESCENT APERIENT SALINE

This is a finely granulated preparation, which in dissolving produces a sustained sparkling effervescence, and a clear, bright solution. It possesses all the advantages of an agreeable saline, combined with the anti-febrile properties of Chlorate of Potash, of which it contains a considerable percentage. It is, in short, an efficient aperient and febrifuge, and makes an exceedingly pleasant and refreshing beverage.

PRICES. THIS SALINE IS SUPPLIED IN BULK AT

1s. 6d. per pound; 1s. 5d. per pound for 14 pounds; 1s. 4d. per pound for 112 pounds; or in ½-pound bottles (to retail at 1s. 6d.) 11s. per doz.

With or without Labels. It is supplied also on the same terms with A. & H.'s own Labels and Wrappers ready for Retail Sale. SAMPLES FREE ON APPLICATION.

MANUFACTURED BY

ALLEN & HANBURYS, PLOUGH COURT, LOMBARD STREET, LONDON.

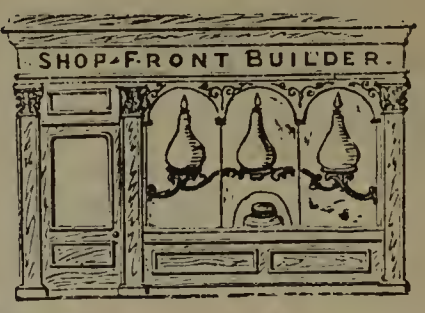
SHOP-FITTINGS.

ESTABLISHED 1830.

SAMUEL HOWLETT,

4, LINDLEY STREET (formerly called North Street), SIDNEY STREET, MILE END, LONDON, E.

A few minutes' Ride by Omnibus from the Bank.



MEDICAL AND GENERAL SHOP-FITTER.

Shops fitted by S. H., and to whom references are kindly permitted:—

Messrs. Corbyn, Stacey, & Co., 7, Poultry, E.C.
Mr. H. Deane, Clapham, London.
„ John Broad, Rise House, Hornsey Rise, N.
Etc. Etc. Etc.

Mr. N. Nicholson, Canonbury, London.
Messrs. Leath & Ross, St. Paul's Church Yd., London.
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Messrs. Harvey & Reynolds, Leeds.
Mr. W. F. Smith, 280, Walworth Road, S.E.
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Cabinet Fitter to the Pharmaceutical Society of Great Britain. Manufacturer of every description of Air-tight Glass Show-Cases for Chemists, Jewellers, etc. Medical Labelling, etc. Plans and Estimates for Entire Fittings and Alterations supplied.

MEDICAL SHOP FIXTURE WAREHOUSE.

ESTABLISHED 1830.

WILLIAM HAY & SONS,

24 & 25, LITTLE QUEEN STREET, LINCOLN'S INN, LONDON, W.C.

MANUFACTURERS OF EVERY DESCRIPTION OF

Medical Shop Fittings, Glass Cases, Drawers, Counters, Desks, Soda Water Stands, &c.

DEALERS IN GLASS, EARTHENWARE, AND ALL KINDS OF SHOP UTENSILS.

Labelling, Embossing & Writing on Glass. Plans & Estimates for the entire Fitting of Shops, &c.

The Largest Stock of Fittings in London.

EXPERIENCED WORKMEN SENT TO ALL PARTS OF THE COUNTRY.

W. HAWKE & SON

SHOP FITTERS AND SHOP-FRONT BUILDERS

WILD COURT, GREAT WILD STREET, DRURY LANE, LONDON, W.C.

Medical Glass, Earthenware, Utensils, &c.

CLOSED AT 5 P.M.; SATURDAYS, 12 A.M.

MODERN SECOND-HAND FITTINGS PURCHASED OR EXCHANGED.

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THE PHARMACEUTICAL JOURNAL

AND

TRANSACTIONS

HAS A

Guaranteed Circulation of 7000 Copies Weekly.

(The LARGEST BONA FIDE Issue of any Journal addressing Chemists and Druggists.)

Terms for Advertisements may be obtained of the Publishers,

J. & A. CHURCHILL, 11, New Burlington Street, London, W.

TO CHEMISTS.

An Important Addition to your Business.

NUBIAN LIQUID WATERPROOF BLACKING,

THE ORIGINAL AND SELF-SHINING. ☞ NO BRUSHES REQUIRED.

Easily applied with sponge attached to the cork. Keeps its polish for a week in all kinds of weather.
Cleanest, Best, and Cheapest for Boots, Shoes, Harness, and all Leather Goods.
Price **1s.** and **2s.** per Bottle.

NUBIAN FURNITURE POLISH,

In Glass Bottles and Cartoons.

Easily applied with sponge attached to cork. Will not smear or clog, and produces a brilliant polish with little labour. Price **6d.**

LADIES' "PET" BOOT POLISH.

A Light Dressing for Ladies' and Children's Boots.

A Preparation which does not soil the most delicate clothing, and will not harden or crack the leather or peel off. Price **6d.** per Bottle.

THE NUBIAN MANUFACTURING COMPANY, 8 & 9, Hosier Lane, Snow Hill, London, E.C.

GEORGE TREBLE & SON,

SHOP FITTERS AND SHOW CASE MAKERS.

PLANS AND ESTIMATES SUPPLIED.

BRIDGE WHARF, WHITMORE ROAD,

HOXTON, LONDON, N.

Agents—S. MAW, SON & THOMPSON, 7 to 12, Aldersgate Street, CITY.

GREAT SAVING OF MONEY AND LABOUR. **SOMETHING NEW** ELEGANCE AND DURABILITY COMBINED.

PATENT RECESS LABELLED SHOP ROUNDS. Parties about to Open New Establishments or Refit Old Premises, should compare following Net Prices. *These Prices include Glass Labels attached to Bottles ready for use.*

Size.	Height.	Flint Glass. N.M.	Flint Glass. W.M.	Blue Glass. N.M.	Blue Glass. W.M.	
16 ounce	8 inches	16/6	18/6	20/	22/	per dozen.
20 ,,	9 ,,	17/6	20/	21/	23/	,,
32 ounce	10½ inches	20/	22/	22/	26/6	per dozen.
42 ,,	11 ,,	22/	25/6	26/6	30/	,,

Prices of other Shop Bottles, &c., on application. *Sample Bottle sent on receipt of* **1s. 7d. in stamps.** *Fac-Simile* sheet Labels, in various styles, sent on receipt of two stamps. *Amongst others, the following parties have recently been supplied with these Bottles:—*

Ady, Dr. J. C., Rangoon
Beckwith, H. B., Grenada
Bilton, J. W., Stoke-on-Trent
Blair, John, Cork
Boot, J. & M., Nottingham
Brevis, John, West Hartlepool
Brumwell, H., Sutton, St. Helens
Brunton, W. W., South Kensington, London
Catford, O. W., Crewkerne, Somerset
Cullen & Co., South Norwood, London
Day, J., Savile Town, Dewsbury
Drummond, J. A., Belfast
Gardner, A. W., Auckland, N.Z.
Gibbs, R. D., Smethwick
Hardcastle, J., Waterloo Road, Leeds
Lodge, G. H., Rotherham.
Mason, W. D., Grimsby
Maston, G., Hartlepool
McCaul, J. & G., Londonderry
McRae, Alexander, Edinburgh
Morris, J. L., Moss Side, Manchester
Parsonson, T., Jersey
Pattison, H., Coleham, Shrewsbury
Pittuck, F. W., Hebburn-on-Tyne
Quiray, W. D., Belfast
Rand, E., Wagga-Wagga, New South Wales
Robinson, H., Guisely, Leeds
Senior, Harold, Norwood Lane, London, S.E.
Sibthorpe, S., Wolverhampton
Smith, Albert, Ilfracombe
Taylor, W. G., Hungerford
Walton, M. F., Sowerby Bridge
Waterhouse, A., Dewsbury
Wills & Wootton, Westminster College
Wing, Lewis, Chislehurst
Woodcock, A., Coltishall, Norwich

Sole Agents: GLASGOW APOTHECARIES' COMPY, Virginia St., Glasgow.

66, PENTONVILLE ROAD, LONDON, N.

W. J. LEMAITRE & CO

ESTABLISHED 1830.

Manufacturers of

COUNTER SHOW CASES,
BRASS WINDOW FITTINGS,
POLISHED-EDGED GLASS SHELVES,
COUNTERS, DRAWERS, DESKS, &c.

MEDICAL & GENERAL

SHOP FITTERS

WRITERS, DECORATORS, &c.

Estimates Free.

SHOW JARS AND COVERS,
MEDICAL LABELLING,
WOOD AND GLASS LETTERS,
FACIAS AND WIRE BLINDS,
BOTTLES, CARBOYS, &c.

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NATURAL BITTER WATER OF FRIEDRICHSHALL

INGRAM & ROYLE,

119, QUEEN VICTORIA ST., LONDON, E.C. & BATH BRIDGE, BRISTOL.

Price List and Pamphlet on "Natural Mineral Waters : their Properties and Uses," forwarded on application.

TRADE MARK.

The Stag with Olive Branch.

R. J. FULLWOOD & CO.

The Original Inventors of the Prime, Rich, Golden-Colour Cake and Fluid Extract of

ANNATTO.

FOR COLOURING CHEESE, BUTTER, &c.

TO BE HAD GENUINE ONLY FROM THE STEAM ANNATTO WORKS,

31, Bevenden St. (late 24, Somerset Place), Hoxton, London.

ESTABLISHED 1785.

KANGRA VALLEY

INDIAN TEA GROWERS' ASSOCIATION

7, NEW COVENTRY STREET,

LEICESTER SQUARE, W.

PROSPECTUS.

The object of the Planters who have formed this Association is to establish a business for the direct supply of Tea from the Plantations of the Kangra Valley to the public.

So great a success has attended the efforts of the promoters of the Association that it has become necessary that one of the Planters should reside in England to manage its affairs.

The distinctive feature of the business of this Association is that the Tea is delivered to consumers in the original One Pound tin-foil lined parcels in which it is packed in the Valley, and it is guaranteed to be absolutely pure.

Vide **Allen's Indian Mail**, Feb. 28, 1883 :—"* * * We can speak from actual knowledge of the excellence of the Teas of the 'Kangra Valley Indian Tea Growers' Association,' and as in advertising them we are also benefiting those who take advantage of their enterprise, we append their modest prospectus, which promises no more than they are well able to perform."

These Teas, retailing respectively at 4/, 3/, and 2/6, can be purchased in any quantity, either direct from the Store, 7, New Coventry Street, or from

Messrs. BARCLAY & SONS, 95, Farringdon Street,

Agents to the Association, from whom Show Cards can be had on application.

Special Terms granted to all Chemists and Druggists, to whom the Teas, on account of their absolute purity, are particularly recommended.

COOPER'S

SHEEP DIPPING POWDER

Is soluble in Cold Water, and should be used in preference to any other Dip,

FOR TICKS, FLY, SCAB, AND FOR ALL OTHER SHEEP DIPPING PURPOSES.

This Dip has been in use for 40 years, and has never been equalled by any other; it is of uniform strength, does not stain the wool, is suitable for all climates, and is equally good as a Summer or Winter Dip. It is especially recommended for Dipping Lambs, and as a certain Cure for Scab. It supersedes all Carbolic and other Liquid Dips, being so much more reliable and lasting in its effects.

Counter Bills and Directions in English, Spanish, Dutch, &c., may be had free on application.

COOPER'S FLY POWDER

For Preventing the Fly Striking Sheep and Lambs, Destroying the Maggot, &c.

In 1 lb. packets to retail at 6d., and 2½ lb. perforated Canisters to retail at 1s. 4d.

This Powder may also be had labelled with the *retailer's own name and address*, provided not less than one gross packets or 6 dozs. canisters be taken at once.

SPECIALLY LOW QUOTATIONS FOR QUANTITIES IN BULK.

Samples on Application.

Terms and further particulars may be had of the Proprietor,

WM. COOPER, M.R.C.V.S., Chemical Works, Berkhamsted, Herts.

YOUNG & POSTANS' PHOSPHORISED COD LIVER OIL

THE ORIGINAL PREPARATION. BEWARE OF SPURIOUS IMITATIONS.

Vide the *Lancet, Brit. Med. Journ., Lond. Med. Record., Med. Times and Gazette, and Echo de la Press Medicale.* "In 1853, Dr. GLOVER recommended the use of Phosphorised Cod Liver Oil."—*The Lancet*, January 8, 1853. (A little over six years ago and more.)

35. BAKER STREET. W.

BURROUGH'S SPIRITUS RECTIFICATUS, P.B.

SPIRITS OF WINE CHEMICALLY PURE

The Best English Grain Spirit, free from Fusel Oil.

56 over proof, 19/7 net, prompt Cash, for 5 gallon quantities; also Finest Orange Wine and Sherry for medicinal purposes.

CALE STREET DISTILLERY, LONDON, S.W.

Duty free for Exportation—also best Methylated Spirit at lowest prices.

TRADE BRIGHTON Hooper's SELTZER MARK

HOOPER'S
BRIGHTON SELTZER

Per 2s. 6d. doz.

SIX DOZEN CARRIAGE FREE.

Special Terms for Quantity.

HOOPER AND COMPY.

Manufacturers and Importers of Mineral Waters,

7, PALL MALL EAST, LONDON.

PRICE'S PATENT CANDLE COMPANY (Limited)

Works:—Battersea, London, & Bromborough, Liverpool.

Price's Pure Glycerine for Medicinal Purposes.

Price's Glycerine for Ordinary Use.

Price's Glycerine Soaps.

Price's Carbolic Disinfecting Soaps, for Nursery, Bath-room and Household Purposes.

Price's Carbolic and Glycerine Soap.

RAYNER'S
LIME FRUIT
SYRUP.

"RAYNER'S LIME FRUIT SYRUP"

is the Best, Purest, and most Wholesome.

Send for Price List.

ENTIRELY FREE FROM ALCOHOL.

IMPORTANT LETTER.

To the Editor of THE WESTERN MORNING NEWS, *Sept. 4th*, 1882.

NON-INTOXICATING BEVERAGES.

SIR,—I saw a remark in your paper some days ago that as yet no satisfactory non-intoxicating drink had been invented for a beverage. I confess that I have been disappointed with many that have been recommended for this purpose, but there is one that I much wish you to try, and if you approve of it you may do the public much good by making your opinion known. It is "Rayner's Lime Fruit Syrup," made by Rayner and Co., Farringdon Road, London, E.C. It may, of course, be procured through any respectable shopkeeper, and the cost is only 1s. 6d. for a large reputed quart bottle. The Syrup is to be mixed with water in about the proportion of one to four, and makes in this way a delicious drink, free from the musty flavour which commonly attends the ordinary lime juice as sold in shops. My experience of the drink is that it is not only agreeable but also a valuable remedy in what usually pass under the name of scorbutic affections. Faithfully yours, JOHN THOMPSON, M.D. & F.R.C.S.

Lynton House, Bideford, August 30th, 1882.

Sold in Champagne Pints, 1s.; Quarts, 1s. 6d. each, by Chemists, Grocers, &c.

RAYNER & CO., Sole Manufacturers, Farringdon Rd., London, E.C.

A profitable Agency for Chemists. Energetic Agents wanted in all districts where not represented.

Apollinaris

'THE QUEEN OF TABLE WATERS'

BRITISH MEDICAL JOURNAL.

ANNUAL SALE, TEN MILLIONS.

'Apollinaris Water, by its absolute purity, affords complete guarantee against the dangers of zymotic disease incidental to ordinary drinking-water. Its sparkling and refreshing character renders quite unnecessary the introduction of ice into it. There is, of course, no objection to icing Apollinaris, as champagne is iced, by the application of cold to the glass or bottle containing it until its temperature is brought down in hot weather to a pleasant coolness. So treated, it is a beverage as refreshing and agreeable as it is pure and wholesome.

'Earl Spencer, K.G., *the President of the International Medical Exhibition, at the great Medical Congress in London, referred to Apollinaris in his opening address as a typical beverage approved by the faculty. This approval is ratified by the unerring tastes of the cultivated populations of the world. The desiderata of original purity laid down by the* Right Hon. Lyon Playfair *as the indispensable conditions for water, which can never be freed from sewage pollutions when once they have been allowed to pass into it, are amply fulfilled by Apollinaris.'*

SANITARY RECORD, March, 1882.

SOLE IMPORTERS,

THE APOLLINARIS COMPANY, LIMITED,

19, REGENT STREET, LONDON, S.W.

"THE MONTH."

The refreshing showers of the last few weeks have given quite a new start to vegetation, and a large number of medicinal plants are consequently coming into blossom. The tall spikes of digitalis are ornamenting the hedgerows, and the pretty lilac-blue flowers of dulcamara are peeping out from the wealth of foliage through which its long straggling stems climb. In chalky woods the belladonna is beginning to put forth its lurid purplish-brown bells, and in the cottage garden the aconite (*A. Napellus*) is opening its helmet-shaped blossoms. At the Royal Botanic Gardens, Regent's Park, this species may be seen in blossom, while *A. paniculatum*, *A. ferox*, and *A. autumnale* are not showing any signs of flowering. An interesting hybrid at these gardens has been formed by cross-fertilization between the *Rheum officinale*, Baillon, and *R. australe*, Don. The plant has the reddish inflorescence and entire leaves of the latter, and the habit and size of the former. The *Rheum officinale* is now a splendid sight, its tall branching inflorescence being nearly 8 feet high, while not far off an equally tall but less branching inflorescence of *Rheum palmatum* forms almost as conspicuous an object. Other medicinal plants at present in blossom in the Gardens are, the black and white mustard, rue, hemlock, buckthorn, mulberry and pellitory of the wall. Several rare or uncommon British plants may also be seen in blossom at the present time, among which may be mentioned *Silene quinquevulnera*, *S. italica*, *Geranium pratense*, and *Reseda alba*. In one of the flower-beds may also be noticed *Orobanche minor*, apparently growing on *Nepeta Glechoma*. In the Economic House the singular *Xylophylla longifolia* is in blossom, the flattened peduncles looking like leaves with flowers at their margins. In the pots in the orchid house the male and female fructification of *Marchantia polymorpha* is now in a fit state for dissection.

One of the handsomest of our native spurges, *E. Lathyris*, is now in excellent condition for examination of the flowers and fruit, and is perhaps the best plant that could be chosen at this time of year for the purpose of studying the character of the genus and order. The leaves, unlike those of all the other British species (except *E. Peplis*), are opposite and decussate. The young fruits bear some resemblance to capers, for which they are sometimes pickled as a substitute, or even mistaken for the true caper. Hence the name of "caper spurge" applied to this plant. The seeds when recent are, according to Pereira, acrid and narcotic, and contain an oil similar in properties to croton oil, of which the dose is three to ten drops. The use of the pickled fruits would therefore be dangerous in quantity, especially if gathered when nearly ripe. A section of the spongy pericarp of the unripe fruit forms an interesting object for the microscope, the mesocarp being composed of a loose network of cells. The seeds were formerly used in medicine under the name of *Semina cataputiæ minora*.

One of the most common plants in the hedge-rows at this time of year is the *Galium Aparine*, which, were it not for the minute hooked prickles which everywhere cover its stem, causing it to adhere to the clothes of the passer-by, might easily be overlooked, its greenish-white flowers being very small and inconspicuous. It has long been known as a popular domestic remedy for "impurity of the blood," and indeed was brought under medical notice some years ago by Dr. Winn, in the treatment of lepra. Dr. Quinlan, who not long since directed attention to another of our indigenous medicinal plants, *Verbascum Thapsus*, in the treatment of phthisis, now gives the results of his experiments with *Galium Aparine*. He finds that in ulcerated sores a poultice made by beating the fresh herb into a pulp in a mortar acts as a slight steady stimulant and powerful promoter of healthy granulation. In one case mentioned by him in the *British Medical Journal* (June 16, p. 1174), in which skin-grafting and sponge-grafting proved useless, a sore 8½ inches long and extending nearly round a leg was reduced to half the size in a month by the use of a poultice of this plant. As there is a difficulty in obtaining the plant in a fresh state in the winter and spring, Dr. Quinlan recommends that it should be preserved during the winter months by the process of ensilage, the plant being chopped into small pieces and rammed down by screw pressure into glazed earthenware jars with air-tight covers, which should be buried in the ground. Thus preserved, it has been found quite fresh and sweet at the end of a month.

The ancients seem to have understood the secret of preserving the colours of flowers. In some funeral wreaths found in the coffins of the Egyptian kings, Amenhotep I. and Aahmes I., the colours of the flowers were admirably preserved, so that they were easily recognized although placed on the breasts of the mummies at least 1700 years B.C. Among others were florets of the safflower (*Carthamus tinctorius*), *Acacia nilotica* and *Sesbania ægyptiaca*, plants which are still used in medicine or the arts in Egypt. There was also found in an Egyptian tomb a basket of the lichen, *Evernia furfuracea*, which at the present day is sold in the drug bazaar in every town in Egypt. Mixed with this lichen were fragments of *Usnea plicata*, and the straw of a grass, *Gymnathelia lanigera* (*Andropogon laniger*, Desf.), from Nubia, which at the present day is used by the natives as a remedy against affections of the chest and stomach, the odour of the grass (the *Juncus odoratus* of old writers: 'Pharmacographia,' 1874, p. 662) being still preserved to some extent. Mixed also with this lichen was another (*Ramalina græca*) found only in the Greek Archipelago, thus proving that commercial intercourse existed between the Greeks and Egyptians, 1000 years before Christ. A set of the wreaths, the best that could be obtained after the selection made for the Museum of Boulak, has been presented to the Kew Museum by Mr. Maspero, through Dr. Schweinfurth, and were recently exhibited at the Royal Society. They may now be seen in a case on the first floor, in No. 1 Museum, Kew Gardens.

In an editorial article in the *Gardeners' Chronicle* (June 23, p. 792), there is an interesting summary of little known facts relating to the structure of the leaf buds, the gyrating movements of the young shoots and the arrangement of the leaves in different coniferous plants, which is well worthy of reading by those who may find a walk through a pine wood somewhat monotonous, as it shows that there are modes of growth and development which enable the species of this somewhat difficult group of plants to be easily recognized. It also opens a wide field for further observation.

It is generally supposed that plants will only

graft well on others of the same natural order. A cultivator of the Ardèche, named Marcel, whose vines had been invaded by the phylloxera, has, however, succeeded in grafting a vine on the common bramble (*Brit. Med. Journ.*, p. 1097). Two brambles thus grafted with French vines have been sent by M. Henzé, Inspector-General of Agriculture, to the Versailles gardens, where the experiment will be continued.

Viola pedata, a plant official in the secondary list of the last United States Pharmacopœia, is now recommended in the *Gardeners' Chronicle* (p. 762) as an ornamental plant, especially the white-flowered variety. Although introduced into this country in 1759, it does not appear to have met with the favour its beauty deserves.

Arnica montana is now in bloom in botanical gardens, and when well grown, with flower-heads 2–3 inches across, is a really handsome plant.

At the evening meeting of the Royal Horticultural Society, held in the rooms of the Linnean Society on the 12th inst., a specimen of *Curcuma Zedoaria* in flower was exhibited. This plant is the source of the zerumbet root, formerly used in medicine in this country. Another medicinal plant, *Asimina triloba*, was exhibited by the Curator of the Cambridge Botanical Gardens. A very interesting series of Irises, arranged in a circle and showing every gradation of hybridism between two species, was exhibited by Professor Michael Foster, who takes great interest in this group of plants.

At the meeting of the Edinburgh Botanical Society, on June 14, a specimen of the costus plant, *Aplotaxis auriculata*, was exhibited in flower for the first time since it was sown, in November, 1873, from seeds sent by Dr. Bellew, from Yarkand. It had been grown in the open ground. The fragrant root of this plant, which has an odour resembling that of violets, is occasionally sent to this country, being an article of considerable traffic in the East for use in perfumery, in the manufacture of incense, and for protecting clothes from the attack of moths.

A case of poisoning by laburnum flowers is described (*Brit. Med. Journ.*, June 9, p. 1117), in which a child four years of age had eaten some of the blossoms. The symptoms were similar to those produced by eating the pods, the surface of the body being cold, the pupils dilated, and vomiting frequent. Although cases of poisoning by the pods occur somewhat frequently they are rarely fatal, owing to the emetic action of the plant, and the treatment with an ordinary emetic followed by a stimulant usually ends in recovery, as it did in this case.

Some interesting information on amber is contributed in a review in *Nature* (June 14, p. 152) of Goppert and Menge's 'Die Flora des Bernsteins.' It is there stated that amber is the produce of at least six species of the fir tribe, the chief being close allies of the common spruce and the American *Pinus Strobus*. The group of coniferæ of the amber flora comprise representatives from nearly every geographical province. It is estimated that although the annual yield of amber is 200,000 to 300,000 lbs., there is still sufficient in the bed of the Baltic Sea to supply the same quantity yearly for thirty thousand years to come.

Bonaccorsi, who commenced studying the antagonism of various drugs in 1877, has lately come to the conclusion, as the results of his experiments, that morphia is antagonistic to nicotine, and that in cases of nicotine poisoning opium or morphia is to be preferred to any other remedy (*Practitioner*, p. 459). He does not find any antagonism between morphia and hyoscyamine, or between morphia and daturine.

A newly observed action of euonymin is mentioned in the *British Medical Journal* (June 2, p. 1060) by Dr. E. A. Cook. He finds it at first causes an increase in the amount of uric acid excreted, followed by a decrease in the amount, even if the use of the drug be continued.

On page 1064 of the same journal, Dr. J. Beddoe states that if the extract of *Cannabis indica* be prescribed in the form of a pill, the addition of an equal weight, or a somewhat greater quantity, of sulphate of potash will cause its action to be tolerably speedy and certain by causing the minute division of the extract.

Dr. G. C. Wallich, in the *British Medical Journal* (June 23, p. 1224), throws some light on the conflicting statements which have been made as to the value of *Cannabis indica*. He states that he found, when residing in India, that the uncertain action of the drug was due to inherent differences in the composition of the extract incident to its being grown either on the plains or in the hilly districts of India, the extract obtained from plants grown on the hills being much superior to that grown on the plains.

The oxytocic action of quinine having been called in question recently, Dr. U. Hartigan, of Hong Kong, writes to the *British Medical Journal* (p. 1064) to say that he has found it increase the menstrual flow, and that in doses of 3 to 5 grains it causes "labour pains," whilst a dose of 10 grains produces abortion. He has also learned that the Chinese take it for the purpose of producing abortion, following its use by copious draughts of tea. Quinine is so commonly resorted to as a domestic remedy for neuralgia that it is well this action should be as widely known as possible.

In an article in the *Medical Press* (June 6, p. 487), Dr. D. H. Cullimore recommends the use of the moxa in certain chronic inflammatory diseases of the spinal cord, and some intractable and often incurable diseases depending thereon. Instead of using the artemisia of China, or other substances commonly used for this purpose, he recommends that the moxa should be made of a piece of brown paper 15 inches long by 4 broad, saturated with a solution of nitrate of potassium of the strength of 1 drachm to 1 ounce of water. The paper is then dried and rolled into a cylinder so that it resembles a short cigar without tapering ends. It is applied by lighting one end and placing the other on the skin in the vicinity of the subjacent disease, the neighbouring parts being protected with alum paper having a central hole. The burning part is never allowed to come in contact with the skin.

A new preparation of ergotin is described in *New Remedies* (p. 171). It is in the form of small cylinders of gelatin, each containing 3 grains of ergotin, which is mixed with the gelatin when in a melted state. These cylinders are kept in a small test-tube in the pocket case, and when wanted for use one of them is dissolved in the test tube in a quantity of water corresponding to the desired volume by means of a gentle heat, for which the flame of a match is sufficient.

The use of small doses of medicines frequently repeated instead of larger doses given three times

a day seems to find advocates in the United States as well as in this country. Dr. A. A. Smith, in a lecture delivered some weeks ago and mentioned in the *Medical Times and Gazette* (June 2, p. 621), recommends chlorate of potash in grain doses every half hour in scarlet fever as not being liable to produce dangerous inflammation of the kidney, which sometimes results from a large dose; also, salicylate of sodium in doses of 2 grains every half hour for nettle rash, 5–10 minims of fluid extract of jaborandi every half hour in Bright's disease, and bromide of sodium in $\frac{1}{2}$ or 1 grain doses in the nervous complaints of children. Many other drugs are mentioned as being given with advantage in small often-repeated doses, such as aconite, digitalis, tartar emetic, Calabar bean, cantharides, ergot, hamamelis and gelsemium.

Drs. Weir Mitchell and Reichert have recently published some interesting facts relating to the venom of serpents. They find that all the venoms they have examined present certain characteristics in common. They are invariably of acid reaction, and, when dried, soluble in water save for a slight cloudiness. The authors do not find an alkaloid in any of them, but in every case the poison appears to be made up of three distinct proteid bodies. These they have named respectively, peptic, globulin and albumin venoms. The first, which they say is a peptone, is less active than the combined poisons, but reduces the blood pressure, induces œdema, and finally produces putrefactive effects. The second is an extremely virulent substance, $\frac{1}{20}$ of a grain being sufficient to kill a strong pigeon in two hours; it gives rise in a few minutes after injection to enormous infiltration of blood into the neighbouring tissue. The third is doubtfully poisonous.

At a meeting of the Physiological Society of Berlin (May 11), Professor Brieger reported further results of his studies of the poisons formed by the decomposition of animal bodies. He obtained the hydrochlorate of a diamine base in crystals, having the formula of $C_5H_{14}N_2H_2Cl_2$, which no longer possessed the toxic properties of the extracts of the products of decomposition. A second crystalline substance, but which was extremely poisonous, has the formula $C_5H_{11}NCl$. One milligram of this substance in solution, subcutaneously injected into a rabbit, produced symptoms characteristic of fish poison, and death in convulsions in a short time. The first-mentioned body could only be prepared from decomposing meat, but not from the later stages of putrescence, nor from decomposing fibrin or other albuminous substances. It would throw some light on fish poisoning if the alkaloid which produced similar symptoms could be obtained from decomposing fish. It would also be interesting if the effect of milk on the alkaloid could be ascertained, since milk is commonly used as an antidote in cases of fish poisoning, and Professor Brieger has shown that these bases are decomposed with extraordinary facility.

Dr. George Thin, who has been investigating the identity of the bacillus of leprosy obtained from different parts of the world (*Brit. Med. Journ.*, June 16, p. 1178), finds that the *Bacillus leprœ* is the same in all cases and that it closely resembles that of tuberculosis in size, in beaded appearance and in its action with regard to the dyes methylanilin, fuchsin and gentian violet.

In a recent meeting of the Crefeld circle of the German Pharmaceutical Association, Dr. Brunnengräber stated (*Pharm. Zeit.*, No. 48, p. 387) that whilst examining a number of samples of quinine sulphate from various manufacturers he had observed the presence in the solutions of what appeared to be fine threads, which at first he thought were accidental impurities, but afterwards discovered, upon microscopic examination, to be fungoid growths (*Aspergillus glaucus*), attached to minute fragments of linen and cotton fibre. The presence of this fungus he attributes to the fact that makers of quinine sulphate, in order to retain as much water of crystallization as possible, dry the salt at as low a temperature as they can, and possibly do this by spreading the salt out upon linen or calico, which would account for it becoming contaminated with both the fungus spores and the fibres. Dr. Brunnengräber explains in this way the known instability of quinine, morphine and atropine solutions, and he recommends a preliminary boiling and filtration when it is desired to have a solution that will remain clear and unaltered.

When the weak base caffeine ($C_8H_{10}N_4O_2$) is submitted to the action of boiling baryta water it is converted, with separation of baric carbonate, into a stronger base ($C_7H_{12}N_4O$), which has been named "caffeidine." According to Dr. Maly, however, caffeidine is the product of a secondary reaction, there being an intermediate formation of a monobasic acid, represented by the formula $C_8H_{12}N_4O_3$ (*Pharm. Post*, xvi., 268). This acid may be conveniently prepared by allowing caffeine to digest at the ordinary temperature with a solution of an equivalent of potash until it has all disappeared, which requires about a fortnight, when upon neutralizing the solution with acetate of copper the acid is combined as a sky-blue, crystalline, scarcely soluble copper salt ($C_8H_{11}Cu_2N_4O_3$), from which the acid is obtainable by decomposing with sulphuretted hydrogen, concentrating in a vacuum, dissolving in chloroform and precipitating by benzol. Upon boiling with water the acid splits up into carbonic anhydride and caffeidine; it is, therefore, caffeidincarbonic acid. Theobromine is not similarly attacked by alkalies and yields neither a corresponding acid nor "theobromidine;" in fact it forms compounds with some bases, that with barium being especially characteristic.

Strychnine is not very freely soluble in strong acids, but is more readily dissolved by dilute acids. An explanation of this is put forward by Messrs. Hanriot and Blarez (*Comptes Rendus*, xcvi., 1504), which is that in presence of an excess of acid a salt is formed that is less soluble in an acid liquid than in water. Thus when a concentrated solution of a neutral salt of strychnine is treated with a little of the corresponding acid a precipitate is formed, and the same occurs even in a dilute solution, but more slowly. In the case of the sulphate crystals have been obtained, which gave upon analysis results corresponding fairly to the composition of an acid sulphate of strychnia ($C_{22}H_{22}N_2O_2,SO_4H_2$). This salt is very soluble in pure water, but much less soluble in an acid liquid; hence its crystallization. But if the liquid be neutralized with a few drops of ammonia the salt redissolves. The same chemists have also described (*Comptes Rendus*, xcvi., 1671) an acid containing nitrogen, which has been obtained by oxidizing strychnine with potassium permanganate. The silver salt, which is said to be very stable when

exposed to light, is represented by the formula $C_{11}H_{10}AgNO_3,H_2O$. Neither the free acid, nor any of its salts, has been obtained in a crystalline form.

Several interesting compounds of chinoline with other bodies have recently been described. According to Herr Rhoussopoulos (*Berichte*, xvi., 202), when chinoline is allowed to react on iodoform at the ordinary temperature a beautifully crystalline compound is formed, having the composition of methanchinoline hydriodate and represented by the formula $CH(C_9H_7NI)_3$. The compound is conveniently obtained in handsome, large, colourless, transparent needles by mixing ethereal solutions of one equivalent of iodoform and three equivalents of chinoline and allowing the mixture to stand for about an hour. The crystals are soluble in acetic ether, benzol and ligroin, but insoluble in cold water, acids or alkalies. When treated with alcohol, or heated with acids or alkalies, the compound splits up again into chinoline and iodoform. Chloroform does not appear to undergo any similar reaction with chinoline in the cold, but when the mixture is heated to a temperature above 300° C. decomposition takes place, the products of which have not been fully examined. When chloral and chinoline are allowed to react directly upon each other a white mass is formed, having the consistence of butter, which refuses to crystallize and is insoluble in nearly all solvents. But when solutions of chinoline and chloral in ether, or other solvents, are mixed together, only a small quantity of the butter-like compound is formed, and upon removing this by filtration and evaporating the solvent, radiating groups of crystals are formed. The crystals are insoluble in water and are decomposed by alcohol and alkalies; after washing and recrystallizing from benzol they gave upon analysis results showing that they consist of a compound of equal molecules of chinoline, chloral and water, which may be represented by the formula $C_9H_7N.CCl_3COH.H_2O$.

Herr Hock also has been experimenting with a view to preparing compounds that shall combine the therapeutic properties of chinoline and the antiseptic properties of phenol. He reports, however, (*Berichte*, xvi., 885) that when carbolic acid and chinoline are brought together in equivalent proportions they yield, under a considerable rise of temperature, a clear liquid from which he has not succeeded in separating a definite compound. But when resorcin and chinoline are melted together on a water-bath, in the proportion of one molecule of the former to one of the latter, the mixture forms upon cooling a crystalline mass, which can be easily purified by repeated washing and recrystallization from absolute alcohol. A pure preparation may also be obtained by mixing solutions of chinoline and resorcin in dilute hydrochloric acid, precipitating by means of sodium carbonate, and recrystallizing the precipitate from absolute alcohol. The results of an analysis showed that the new compound is a combination of two molecules of chinoline with one of resorcin. Herr Hock states that this resorcin-chinoline possesses marked antiseptic and antipyretic properties, which are being investigated in the hospital at Bern. The compound has a bitter, somewhat acrid taste, and melts at 102° C. It is slightly soluble in cold water (1 in 400), but freely soluble in alcohol, ether and chloroform. In the low-boiling portions of petroleum it is insoluble. Resorcin-chinoline has scarcely any alkaline reaction, though it dissolves completely in dilute hydrochloric acid; but if such a solution be shaken with ether the resorcin is taken up and hydrochlorate of chinoline is left in the solution. It is also decomposed by other acids and alkalies as well as by continued boiling in water. An analogous compound with hydroquinone has also been obtained, and Herr Hock is continuing his experiments upon the formation of others with pyrocatechin, pyrogallol, etc.

Messrs. Lieber and Haitinger (*Ber.*, xvi., 1263) have obtained pyridine from chelidonic acid from *Chelidonia majus*, and from mecouic acid, by distilling the acids produced by the action of ammonia on these bodies with zinc dust.

At a recent meeting of the Royal Society of Edinburgh (*Nature*, p. 167), Mr. D. B. Dott read a paper on "The Acids of Opium," in which he stated that contrary to the usual opinion the principal acid in opium (judged by its acidifying powers) is sulphuric and not meconic acid, a considerable portion of the morphia being always combined with sulphuric acid.

In a paper on the occurrence of salicylic acid in the Violacæ (*Pharm. Journ.*, [3], xii., 627) Herr Mandelin confirmed the presence in *Viola tricolor*, var. *arvensis*, of a yellow substance that had been mentioned by previous observers. He has now made a closer investigation of this compound and reports (*Pharm. Zeit. f. Russl.*, xxii., 339) that it is a glucoside, splitting up in the presence of water into three molecules of sugar and one of a body identical with quercetin ($C_{24}H_{16}O_{11}$) obtained in the decomposition of quercitrin derived from the bark of *Quercus tinctoria*. This new glucoside has been named "violoquercitrin;" it is represented by the formula $C_{42}H_{42}O_{24}$, and its decomposition by the equation $C_{42}H_{42}O_{24}+5H_2O=C_{24}H_{16}O_{11}+3C_6H_{12}O_6$. The decomposition is not, however, so simple as this, a small quantity of a third body being produced, which is characterized by its beautiful fluorescence in alkaline liquids.

In the *Répertoire de Pharmacie* (xi., 246), Messrs. Adrian and Moreaux describe a process by which they have succeeded in preparing quassiin from Surinam quassia wood (*Quassia amara*) in a crystalline form and in considerable quantity. It was obtained by crystallization from alcohol in white light crystals, very soluble in chloroform, soluble in about 90 parts of cold absolute alcohol and in 35 to 40 parts of 80° alcohol, scarcely soluble in ether and soluble in about 300 parts of hot water, from which it is deposited again in the crystalline form upon cooling. The yield of crystals was from 1·25 to 1·50 gram per kilogram of wood; whilst Christensen obtained less than half that quantity, still in an impure condition (see before p. 146). A still further quantity of quassiin can be separated from the mother-liquor, but this appears to be an uncrystallizable modification; it is very soluble in absolute alcohol, more soluble in ether than crystallizable quassiin, and slightly soluble in water.

About a dozen years since M. Duclaux affirmed that copper is normally present in cacao beans, and that its occurrence in manufactured "cocoa" and "chocolate" is not therefore necessarily referable to the use of insufficiently tinned copper vessels, as had previously been supposed. This statement is now confirmed by Dr. Galippe, who reports (*Répertoire*, xi., 277) that he has found copper to be a constant constituent in cacao beans from different sources, both unroasted and roasted, in

varying proportions ranging from 0·0112 gram to 0·0292 gram per kilogram. As might be expected, he has also found copper in chocolate, in proportions varying from 0·005 gram to 0·125 gram per kilogram; some samples of chocolate would therefore appear to contain as much, or even more, copper than is added to preserved peas to give them an acceptable colour. The principal seat of the copper in the bean is the episperm, which is not used in the manufacture of fine chocolates. The *débris* is, however, sometimes bought up by makers of low-priced chocolate, and this would account for a considerable proportion of copper occurring in some samples of chocolate of inferior quality; but the fact that others contain hardly any would seem to suggest that they are equally poor in cacao bean.

Nickel is coming into such general use for plating purposes that it is satisfactory to learn that poisoning by the use of nickel-plated instruments appears to be almost impossible, even when food which comes into contact with the metal is acid. Schulz gave to a dog weighing 4 kilograms separate doses of 0·5 gram of acetate of nickel until 10·5 grams had been taken without producing any ill effect; on the contrary, the animal increased 1 kilogram in weight during the treatment. Schulz also found that traces only of nickel were dissolved by sour milk after eight days' contact with a nickel plated vessel (*Lancet*, June 2, p. 970).

Herr Grünning states that a pure solution of hydrobromic acid may be conveniently obtained by the decomposition of potassium bromide with phosphoric acid and collection of the liberated gas in water. He recommends (*Pharm. Zeit. f. Russl.*, xxii., 315) 100 grams of coarsely powdered potassium bromide to be placed, together with 280 grams of phosphoric acid, sp. gr. 1·304, in a glass retort of half a litre capacity, provided with a delivery tube, and heated over a flame with wire gauze interposed. The bumping of the liquid in the first part of the reaction is liable to break the retort, but it may be diminished by directing the flame on to the side of the vessel; after a a short time the liquid boils quietly until the whole of the salt is converted into potassium metaphosphate. At first water passes over, then some aqueous acid, and afterwards pure hydrobromic acid gas, which should be conducted into distilled water, care being taken to prevent any liquid being drawn back into the retort upon the absorption of the gas. Any chlorine impurity in the potassium bromide would pass over in the first portion of the acid distillate, which should, therefore, be separated and tested for hydrochloric acid.

The incrustation which occurs in the vacuum pans used in the manufacture of sugar from beet-root has already been found to contain the calcium salts of citric, aconitic, tricarballylic and malonic acids. Herr von Lippmann (*Ber.*, xvi., 1078) has isolated another acid from the same deposit. The crude calcium salts were decomposed by dilute sulphuric acid and the resulting solution treated with ether; this when evaporated left a syrupy residue, which on standing for two years yielded needle-shaped crystals of an acid substance that was very soluble in water, alcohol and ether, and upon analysis gave the formula $C_6H_8O_8$. The analysis of the barium and calcium salts showed it to be a tribasic acid, the calcium salt having the formula $Ca_3(C_6H_5O_8)_2$; the corresponding sodium and potassium salts were also obtained and found to be very soluble in water. The substance was evidently identical with the oxycitric acid, obtained by heating chloro-citric acid ($C_6H_7ClO_7$)—which is produced by the action of hypochlorous acid upon aconitic acid—with caustic alkalies. Aconitic acid ($C_6H_6O_6$), tricarballylic acid ($C_6H_8O_6$), citric acid ($C_6H_8O_7$), and oxycitric acid ($C_6H_8O_8$), are all closely related, and their simultaneous occurrence in the beet-root residues is extremely interesting. Citric acid when heated loses water and is converted into aconitic acid ($C_6H_8O_7 - H_2O = C_6H_6O_6$) and aconitic acid by the addition of hydrogen becomes tricarballylic acid ($C_6H_6O_6 + H_2 = C_6H_8O_6$).

It is a curious fact in the history of many great inventions that several experimenters have been on the brink of the discovery, but it has been reserved for one master-mind to bring out the practical result of the teaching of a multitude of experiments made by different investigators. Professor Silvanus P. Thompson illustrates this in some historical notes on physical subjects (*Nature*, June 7, p. 130), in which he shows that the occurrence of a brilliant spark between charcoal points in connection with a voltaic pile had been mentioned by at least three observers in the course of the years 1800 and 1802; but none of these writers spoke of the properties of the arc as a continuous luminous spark. This was probably not produced until 1808 or 1809, when Sir Humphrey Davy, working at the Royal Institution with the large battery of two thousand Wollaston cells, succeeded in obtaining a voltaic arc that could be extended to 4 inches without rupture. It only remained then to devise machinery for maintaining the carbons at a proper distance apart. In like manner Philipp Reis described in the *Journal of the Physical Society of Frankfort-on-Main* as early as 1860–61 an apparatus in which the galvanic current was utilized to reproduce the tones of divers instruments and even to a certain degree the human voice. Concerning its designation the inventor says, "Since the length of the conducting wire may be extended for this purpose just as far as in direct telegraphy, I give to my instrument the name 'telephone.'" Again, in the year 1802, one "Citoyen Martin" advertised in Paris, as a "spectacle extraordinaire et amusant," that he would show "l'expérience du *télégraphie* plus rapide que la lumière."

Herr Pawlewski (*Ber.*, xvi., 1298) has devised a modification of Dumas' apparatus for the determination of vapour densities, which enables one apparatus to be employed for any number of experiments, the capacity of the apparatus being determined once for all. Two forms of apparatus are described, the simpler being merely a conical bulb capable of holding from 20 to 30 c.c., having a tube from 10 to 12 c.m. long, of capillary bore, fitted on and bent a little sideways; this tube is blown out before tapering to a point in a slightly conical form, and upon this end a tightly fitting indiarubber cap is placed. The use of this cap does away with the necessity of sealing the end of the tube when full of vapour, as is necessary in Dumas' method, at the same time enabling the apparatus to be used for any number of experiments. In place of the bulb used in Dumas' method a small beaker is employed which contains the water, oil, paraffin or other substance used, depending upon the temperature required, and in this the apparatus is immersed. Owing to the difficulty of getting such an apparatus as this, having but

one opening, dry and pure after use a second form of the apparatus is described. This has two pieces of capillary tube sealed, the one bent a little sideways and constructed as in the first apparatus, the other fitted with a stopper, and used for the introduction of the substance. This form of apparatus can easily be purified after use by aspiration in the ordinary way.

Professor F W. Clarke (*Science*, i., 485) places on record the fact that a battery cell can be constructed of three non-miscible liquids. A cell is described which consists of layers of mercury, dilute sulphuric acid, and a solution of iodine in ether. Upon connecting the uppermost and lowest layers with insulated wires evidence of a fairly strong current of electricity was obtained with a galvanometer. Theoretically, the resistance of a three-liquid cell ought to diminish with rise of temperature, and Professor Clarke suggests that perhaps a combination of solid plates with the upper and lower liquids would yield a voltaic cell in which the internal resistance would be constant for varying temperatures.

The Bakerian Lecture of the Royal Society was this year delivered by Mr. Crookes, who communicated some new and important results of his investigation upon electric discharges in high vacua. It will be remembered that Mr. Crookes had previously shown that many substances when exposed to the molecular discharge from the negative electrode in a highly vacuous tube emit phosphorescent light, the colour of which varies with different compounds. While engaged in the investigation of the phosphorescence of various substances by means of the spectroscope, Mr. Crookes noted the repeated occurrence of a band having a citron colour. It was most favourably observed by treating the substance with strong sulphuric acid, expelling the excess of acid by heat and then igniting the sulphate to redness. The residue from this treatment gave the band distinctly. A compound which behaved thus was treated by the ordinary chemical methods of separation, and the group precipitates separately examined. In this way the characteristic band was tracked to the precipitate which contained the calcium as oxalate. This calcium oxalate was chemically tested and nothing but calcium was found, the ordinary flame spectrum yielded only the calcium lines, and finally the atomic weight was determined and found to be 39·9 (Ca=40). An examination of the principal native compounds of calcium showed that they all gave the citron band when treated as above described, but certain specimens of lime were found to fail in this respect and hence the conclusion was inevitable that the result was not due to calcium itself, but to some substance constantly associated with it in quantity too small to be revealed by ordinary chemical means. Upon examining a number of other minerals it was found that they nearly all yielded the characteristic citron band, and after a considerable amount of work, special attention was devoted to the minerals cerite and zircon, from which nearly all the rare metals of the earths which they contain were isolated and examined, with the final result that the citron band was without doubt characteristic of yttrium, especially when in the form of sulphate. The spectrum of the phosphorescence yielded by the ignited sulphate in a vacuous tube consists of a broad red band, an intensely brilliant citron band and two equally strong green bands. When only traces are present the citron band alone is seen. Mr. Crookes had not suspected yttrium as the cause of this phenomenon, as pure yttria precipitates by ammonia had been previously examined and gave no phosphorescence, and consequently no citron band. This same specimen when converted into sulphate and ignited at once yielded the distinctive spectrum. Starting from the fact that the number of bands in the spectrum of yttrium is dependent upon the amount of this substance present, a spectroscopic method for the approximate estimation of yttria was devised. By this means it was found that pink coral contained 1 part of yttrium in 200, strontianite 1 part in 500, calcite 1 part 10,000, ox-bone 1 part in 10,000, and tobacco ash 1 part in 1,000,000. Mr. Crookes's results point to a new method of spectrum analysis evidently much more delicate than the ordinary method, in which the spectrum of the body is observed while under the influence of the molecular discharge in a vacuous tube as above described.

SYRUP OF IODIDE OF IRON.*

BY ALVIN G. HAMMER.

The chemical combination of iodine and iron was first brought to the notice of the profession by MM. Baup and Caillot (*Journal de Pharmacie*, August, 1828), and by them recommended in the manufacture of iodide of potassium.

An aqueous solution for medicinal use was subsequently prepared by M. Durand, the formula of which was published in the Journal of the Philadelphia College of Pharmacy for January, 1883. This aqueous solution was, however, not very permanent, due to the fact that the iron salt is oxidized and precipitated out of solution as a sesquioxide of iron, and the iodine is liberated as free iodine. This objectionable feature of its decomposition was to be remedied by the addition of sugar to the solution, and the preservative agent was first recommended by M. Frederking, in 1839. About the same time the subject of protecting the solution of this iron salt was being investigated by Professor Proctor, who published his researches "on the power of saccharine substances in general and uncrystallizable sugar in particular, of protecting the solution of protoiodide of iron from decomposition," in the *American Journal of Pharmacy* for 1840, and subsequently, in the same volume, he again referred to the same subject, stating that he had tried the following saccharine substances as protecting agencies: sugar of milk, manna, sugar cane, honey and uncrystallizable sugar. In summing up Professor Proctor says that either uncrystallizable honey or uncrystallizable sugar (molasses) are the best protective agents of a saccharine character. What seems very remarkable is the fact that such a definite recommendation, based upon the observation of Professor Proctor, should have altogether gone unheeded by the framers of the Pharmacopœia and that subsequent investigators, who are numbered by hosts, should not have taken into consideration the results of his investigation. Another surprising fact is that much diversity of opinion still exists among investigators of this syrup as to what causes the chemical changes are due, and in what they consist. Professor Wayne, in a communication to the *American Journal of Pharmacy*, pointed out the conversion of the cane sugar into that of grape sugar, which change he ascribed to the action of hydriodic acid generated during the process of decomposition of the iodide of iron; but he seems to have overlooked the very important fact that grape sugar might be the very agent to prevent a chemical change in the freshly-prepared syrup.

* A paper read at a meeting of the Iowa Pharmaceutical Association. Reprinted from the *Weekly Drug News and American Pharmacist*.

Professor Maisch, in papers published in the *American Journal of Pharmacy*, 1854-5, states that the chemical change which takes place in the preparation is due to the liberation of free iodine and the precipitation of sesquioxide of iron, and if this decomposed syrup be now exposed to the action of direct sunlight, the free iodine is converted into iodic acid, which forms with the precipitated oxide of iron an iodate of the sesquioxide of iron which salt dissolves in the syrupy liquid, and thus forms a colourless solution. This explanation seems somewhat improbable to me, from the fact that in no specimen of the decomposed syrup that I have met with had the precipitation of the oxide of iron and the liberation of free iodine proceeded beyond a certain degree, and then and there ceased. Now, whenever this decomposed syrup was exposed to the action of sunlight, it would become colourless, and thereafter not again undergo the change which takes place in freshly-prepared syrup of iodide of iron. To determine the correctness of Professor Maisch's theory, I subjected a sample of the syrup of iodide of iron which had undergone decomposition, and had been exposed to the action of sunlight, until it had become perfectly colourless, to the following tests for iodic acid.

With chloride of barium, no precipitate; no reaction with starch and dilute hydrochloric acid when the test was performed by the exclusion of air. When this exclusion was not guarded against the iodine test was obtained, this would indicate the absence of iodic acid. Professor Maisch, no doubt, came to his conclusion by the reaction he obtained with sulphuric acid, which liberated free iodine. It seems to me, however, that this reaction does not prove the presence of iodic acid, for it is a well-known fact that sulphuric acid, if not largely diluted, will liberate free iodine in metallic iodides. In testing for sesquioxide of iron the following were the reactions obtained, which would indicate the entire absence of this oxide of iron: Ferrocyanide of potassium, a white precipitate, which after a few moments acquired a bluish tint; neither tannin nor sulphocyanide of potassium produced any change; carbonate of potassium, a whitish deposit, which soon turned to a green colour; phosphate of sodium, a whitish precipitate, which finally acquired a greenish colour. These results leave no doubt in my mind that the sesquioxide of iron, as first formed in the decomposed iodide of iron syrup, is reduced by the combined action of the sugar and sunlight to the state of a protoiodide of iron.

I will now enumerate a number of experiments made with different processes in preparing this syrup:

No. 1. Made according to the formula of the U.S. Pharmacopœia; it began to change in about three weeks, becoming gradually dark brown; exposed to sunlight, it becomes colourless, having a slight sediment of a light colour.

No. 2. Made like number one, with the addition of twenty drops of a solution of hyposulphite of soda (of the strength of twenty grains of the salt to a fluid ounce of water); this specimen of syrup began to change in three weeks.

No. 3. Made like number one, with the addition of ten grains citric acid to twenty fluid ounces of the syrup; this specimen remained unchanged for about a month, then rapidly acquired a dark brown colour.

No. 4. Made like number one, substituting iron by hydrogen for iron wire, and an addition of ten grains citric acid to twenty fluid ounces of the finished syrup, retaining its colour for nearly two months.

No. 5. This specimen was made like number one, using a pure crystallized sugar (rock candy) for the ordinary crushed sugar; this syrup changed its colour and underwent decomposition in about ten days; a sample of this syrup kept in a dark place, changed in about the same time.

No. 6. This specimen was made by the formula of the German Pharmacopœia, the syrup retained its colour some two months, when it gradually became quite dark brown.

Samples of all the above described experiments were subjected to the same favourable conditions of temperature, light, etc.: also the same sample of sugar was employed in all specimens, excepting number five, which was made with white rock candy, and I am fully satisfied by this result that the purer the sample of cane sugar the less is its preservative qualities. This fact led me to investigate the changes that had taken place in the sugar. The article employed was what is known as crushed sugar, and yielded a syrup up to all the requirements of the Pharmacopœia; when this syrup was tested for grape sugar, previous to the addition of the solution of the iodide of iron, it was found to be entirely free from it; also, it was not present for several days in the fresh prepared syrup of iodide of iron; but the moment that the preparation indicated the least change of colour, just so soon a grape sugar reaction was obtainable. When a certain per cent. of grape sugar had been formed, the change seemed to come to a stop, and proceed no further. If, now the syrup was submitted to sunlight or heat, the decoloration was effected, and the preparation became a permanent one. This fact led me to substitute grape sugar for cane sugar in the formula of the syrup, and although the sample of grape sugar employed was not absolutely a pure saccharine (it containing a certain per cent. of soluble starch or dextrine), yet when exposed for two months to all the varying influences of light and air, the preparation so produced has remained unchanged in colour and chemical composition. The only change that is perceptible is where the syrup has dried in the neck of the vial, which had been left uncorked; here the colour is very decidedly of a dark red, while the body of the syrup in the bottle is a light green. The query arises, What are the causes of the changes which take place, and how can the same be obviated to make a permanent and stable combination of this valuable medicinal preparation?

The following theory is based upon the results of my experimentations: An aqueous solution of iodide of iron is partially acted upon by the oxygen of the air, and changed into free iodine and sesquioxide of iron; the free iodine is converted by heat or direct sunlight into hydriodic acid, and if cane sugar is presented to this acid, decomposition takes place, grape sugar is formed, and free iodine is again liberated; the remaining portion of the unconverted cane sugar at the same time is exerting its action upon the precipitated oxide of iron, deoxidizing it and thereby increasing the per cent. of grape sugar, the liberated iodine again combining with the deoxidized iron to form proto-oxide of iron, and when this is reached it prevents further decompostion of the preparation, and it may now be exposed to oxidizing influences; provided, however, a certain per cent. of grape sugar is present in the preparation. Now the remedy to prevent this decomposition in the preparation seems an easy one, namely, to incorporate a certain per cent. of grape sugar in the preparation, or to produce the same during the process of forming the chemical combination of the iron and iodine. With this latter fact in view, I offer the following formula which, will yield a syrup which, under ordinary circumstances, will remain permanent for such a period as saccharine solutions usually can be relied upon:

Syrup of Iodide of Iron.

Take of Iodine	2 troy ounces.
Iron in the form of wire and cut in pieces	300 grains.
Distilled water	3 fluid ounces.
Syrup, sufficient quantity.	

Introduce the iodine, iron and distilled water into a flask of thin glass: shake the flask occasionally, until the reaction is about to cease, and is acquiring a greenish colour; now add to the mixture four fluid ounces of simple syrup, and then heat the mixture slowly, until it is brought to the boiling point; then, having introduced twelve fluid ounces of syrup into a graduated bottle, heat it, by means

of a water-bath, to 212°, and through a small funnel inserted into the mouth of the bottle, filter into it the solution already prepared; when this has passed, close the bottle, shake it thoroughly, and when the liquid has cooled add sufficient syrup to make the whole measure twenty fluid ounces.

In conclusion, I will say that I believe that in the above modified formula of United States Pharmacopœia I have accomplished the object of presenting to the profession a formula for this syrup which is quite permanent, due to the fact that during the chemical action between the iron and iodine the cane sugar, which had been added in the form of simple syrup, is converted partially into grape sugar, which does away with the addition of foreign substances, like citric acid, etc., to the preparation. The formation and preservative action of grape sugar will also explain the fact occasionally cited by colleagues, regarding the success they have had at one time or another in preparing a syrup of iodide of iron which was permanent. "Due to an accident while filtering the just finished solution of iodide of iron—the paper filter gave way, the turbid liquid was thereby mixed with the simple syrup and to rescue the preparation it became necessary to heat the mixture and pass the same again through a filter, when, lo and behold! a beautiful green-coloured syrup was the product, which also left nothing wanting in way of permancy." This all is due to the fact that the iodide of of iron acted chemically upon the cane sugar, and converted it partially into grape sugar.

Whenever grape sugar of commerce can be obtained in sufficient purity which will fit it for medicinal preparations, then we can easily modify the formula by simply employing this saccharine body without any further manipulation, by adding it to the solution of iodide of iron.

NOTES ON SOME ABNORMAL FLOWERS.*

BY E. ERNEST SEWELL.

A century has almost elapsed since Goethe first published his essay on the 'Metamorphosis of Plants,' in which he pointed out the relationship existing between the various organs of Phanerogams. Earlier investigators, it is true, had recognized that "the leaf was the type of the whole plant," but Goethe revived the theory in a more complete form, and his work is now usually regarded as the foundation of our knowledge of the subject. The common flowers of our gardens afford us many illustrations of its truth; for instance, in the roses and camellias every stage of transition is observable between a perfect stamen and a beautifully rounded petal, and often we see no sharp line of distinction between petal and sepal. Among wild flowers, again, cases constantly occur in which one organ partakes more or less of the structure peculiar to another, as in species of *Geum* and *Primula*, where the sepals are frequently replaced by ordinary green leaves.

In a primrose recently sent to me, while the calyx was little altered, the segments of the corolla had assumed the colour and other peculiarities of the radical leaves,† differing from them in size, and in having the petioles united to form the corolla tube. The short stamens were inserted halfway down this corolla tube, as in normal specimens. The pistil was greatly elongated, and had partially unfolded, thus also revealing its structural relation to the leaf. This "phyllody of the carpel," as it is called, is quite commonly found in primroses, though perhaps the best example of it and the one most frequently quoted is to be found in the flowers of the double cherry.

When we speak of a carpel, stamen or petal as a modified or metamorphosed leaf, it is, of course, necessary to remember that the term leaf is used in rather a wider sense than when we speak of the leaves of a tree—meaning its foliage. For even these foliage leaves, although so much simpler than the floral leaves, have apparently undergone progressive changes in order to fit them for their special functions of assimilation and transpiration, just as the parts of the flower have been gradually differentiated so that they may best fulfil their function of reproducing the species.

Sometimes a single flower will furnish us with more than one example of this reversion to a primitive leaf-type, as in the case of a double hyacinth which I met with a few months ago. It had blossomed indoors in an ordinary hyacinth glass; and this method of water culture had apparently affected its vitality in some way, for the scape bore much fewer dark blue flowers than usual, although many of them were very large, as if to make up for their numerical scarcity in some measure. The lower part of the perianth (D, Fig. 1) in these larger flowers was greatly thickened, while a little higher up it divided laterally into three whorls (1, 2, 3, A), each whorl, of course, having six lobes like an ordinary flower.

Fig. 1.

Some of the lobes of the outside whorl (A, 1) were quite green, while to be tipped with green was the rule rather than the exception. All the segments of the third whorl were more or less thickened and wrinkled at the apex, and so were some of those of the second. Between these three whorls and the central tuft of green leaves (B) two incomplete cycles of petalloid stamens were placed, also purple in colour, and presenting the usual variations of form commonly found in such transitional structures.

One or two anthers were quite normal and contained ripe pollen. In others, one anther lobe would be fairly well formed, whilst the other would be represented by a thin smooth expansion of the petalloid filament or connective. In these cases the true anther lobe was always more deeply coloured than the other as though the same amount of colouring matter had been supplied to each, but in the one it was spread over a large surface instead of being concentrated into a small compass, as in the other.

Two wrinkles or furrows on each side of the flattened connective replaced the anther in some cases. Each of these furrows appeared to correspond to a loculus or pollen-sac, for they were filled with small masses of yellow pollen, which looked as if they were growing there, and under a magnifying lens reminded one of a little yellow fungus growing in the cracks of a tree's trunk, though I suppose it would be more scientifically correct to compare each furrow or open loculus to the sporangium of a Lycopod.*

Turning now to the *Gynœcium*, or rather to the place where the *Gynœcium* ought to be, we find a complete change of colour; a tuft of green leaves (Fig. 1, B) having replaced the carpels. These were still arranged in whorls of six, and the particular flower I am describing had not more than three of these whorls, surrounding a central cone of much smaller scales (C).

The outside lobes of this green tuft were larger than those within, and some had reflexed points or projections

* A paper read before the School of Pharmacy Students' Association, May 24.

† A very similar occurrence was reported in the *Gardeners' Chronicle*, May 19, 1883.

* Sachs' 'Text-book of Botany' (Vines), p. 542.

from the apex, which were also coloured reddish-purple, and apparently corresponded to the sessile stigmas.

Others were characterized by having the upper part of the leaf converted into a kind of pointed hood, which I could not understand at first, but in another flower I found two of these hoods (Fig. 2, B) folded over one

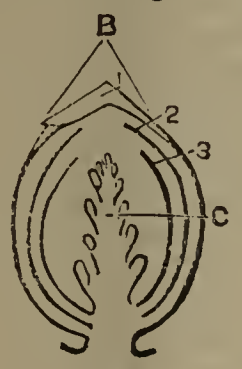

Fig. 2.

another, and in such a manner that it looked like a perfect ovary, until examining it more closely I saw a foliar arrangement (C) within, similar to that of the other flowers near it.

Supposing this outer enclosing whorl to represent the carpellary leaves, it is rather difficult to see what other organs the next two whorls (2 and 3, B, Fig. 1) are morphologically equivalent to. Probably they do not correspond to any distinct part of a normal ovary but are merely repetitions of the outer green whorl formed in a similar way to the inner whorls of the perianth (2 and 3, A, Fig. 1).

The centre of the flower has now to be described. It consisted essentially of a prolongation of the flower axis, covered with small scales, which were white or pale yellow in colour; and they were further distinguished from the surrounding green leaves by the thin fragile nature of their tissue.

The sheathing way in which each scale sprang from the central axis was very noticeable and interesting, although it was only what would be expected when we consider the nature of the other leaves; at the same time they were not so pointed or tapering as the large leaves springing from the base of the scape, but were almost as broad as they were long, having both apex and margins incurved in such a manner as irresistibly to suggest the idea that they represented the ovules of the normal plant. In fact, so much did they resemble ovules with their delicate white tissue, that in the flower first examined I did not immediately recognize their foliar structure, though the resemblance was not quite so marked in most of the other flowers. Their number, too, though of less importance, would tend to support this theory, for although rather difficult to ascertain accurately, I found it varied from eighteen to twenty-four in different flowers. The number found in each of the three cells of the normal ovary is not quite constant, but I have generally found it to be from six to nine.

Dr. Masters, in his 'Vegetable Teratology' (a most interesting work), says, "The ovules of a prolified flower are either unaffected, or they occur in a rudimentary form, or lastly they may be present in the guise of small leaves." But I cannot find after considerable search that there has been any case recorded in which the ovules of a monocotyledonous flower had assumed the form of "small leaves"; in fact, some authorities expressly state that such an occurrence has not hitherto been observed.

This fact in itself might make some hesitate to regard the structures which I have just described as really modified ovules, and perhaps their view would be strengthened if they saw only the upper flowers of the raceme; for it was more particularly some of the lower and larger flowers in which the central scales were so distinctly different from the surrounding carpellary segments; while in the flowers which expanded afterwards, or had not fully expanded, we find a series of whorls gradually diminishing in size from the perianth to the centre. It is very common in "double" flowers to find that the number of whorls is increased at the expense of the ovary and ovules, and in this case we further see that while the plant was comparatively strong some attempt was apparently made to form ovules in the lower flowers, but as the vitality of the plant decreased as it grew older it was unable to differentiate them at all from the surrounding whorls of leaves.

It might still be objected that these axial scales are not in the right position for ovules, in fact that they ought to be found on the margins of the carpellary leaves. I was inclined to think so myself at first, but found on consulting the work already alluded to, that Dr. Masters states* that "teratology shows that ovules may be formed indifferently on leaf-organs or on stem-organs," so now I incline to the opinion that teratology in the case of the hyacinth under consideration shows that the ovules are formed on a "stem-organ." Again, when we consider that in these monocotyledons each leaf grows in a sheathing manner, it is not so readily conceivable that an ovule,—the foliar structure of which has been frequently demonstrated in other plants,—should spring in a sheathing manner from the margin of a leaf, as that it should so spring from a central axis; while there is no reason to suppose that its insertion would be different from that of the other leaves of the same plant. The discussion of the exact nature of the ovule in any particular case can, perhaps, only be decided by expert botanical physiologists, but it is usually admitted that teratology throws much side-light on such a discussion. Sachs takes the view that in plants in which the placentation is axile, as in *Primulaceæ*, or where there is a single erect ovule in each ovary, as in *Piperaceæ*, the ovules spring from the axis of the flower, and are independent of the carpellary leaves. Teratology confirms this view, as the ovules of species of *Primula* have not unfrequently been found in a phyllodic state rising from the central axis. It will be remembered that in *Liliaceæ*,—the natural order to which *Hyacinthus orientalis* belongs,—the placentation is axile though not "free-central."

In order to obtain further evidence on this point, I have examined several other double hyacinths, and have invariably found the gynœcium more or less abnormal, some having free carpellary leaves; but in no other case have I seen the ovules also transformed into leaves or scales. Thus, while the ovules were quite perfect the carpels were phyllodic, so that in one flower in particular the ovules were laid bare, and visible when the flower was looked at from above, clearly indicating that they were not inserted on the margins of the carpellary leaves. In these cases the central axis was greatly swollen and of a fleshy mucilaginous nature, absorbing many of the lower ovules, and in some cases filling the cells of the ovary, when such were formed. On the outside and upper surface of this mass the remaining ovules made their appearance, though sometimes they were not quite round, owing, probably, to the pressure of surrounding tissue.

In two other flowers peculiar structures were observable rising from the axils of carpellary leaves (Fig. 3, *c*.),

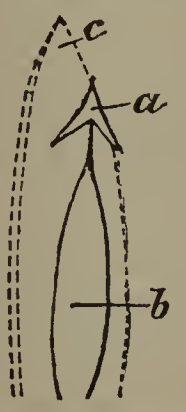

Fig. 3.

* 'Vegetable Teratolog ,' p. 483.

thus being within the gynœcium. An idea of their shape will be better conveyed in a rough sketch (Fig. 3) than in words. The upper part (*a*), resembling an arrowhead, was coloured either yellowish brown or purple, while the lower part (*b*) was translucent and very thin. It will be seen that though they resemble stamens in form they were placed quite out of the right position for such organs, and, as I only found them in two flowers, I was unable to make out their exact morphological relations.

Comparatively little, I believe, is at present known of the exact causes which give rise to a departure from the normal type; but if we knew all about the laws which regulate the growth of cells under peculiar external conditions, and could observe how, in their living state, as they increase and multiply themselves, they sometimes build up the simple flattened form of a petal instead of a more complex stamen, or of a green leaf instead of a carpel, then I think that we should find that even these so-called "monstrosities" are just as truly the results of unchanging laws, as the most perfect Alpine gentian or Californian Sequoia.

THE USE OF METHYLATED ALCOHOL IN LINIMENT AND TINCTURE OF IODINE.*

BY E. GREGORY.

My attention has been called, by a short paragraph in the February number of the *Canadian Pharmaceutical Journal*, to the fact that Mr. Peter MacEwan, of Edinburgh, had made a very interesting report concerning a sample of liniment of iodine, which had exhibited extraordinary pungency. As I have had a slightly unpleasant experience with a somewhat similar compound, a few notes on the subject may not be out of place.

We have a market here for the tincture of iodine made according to the U.S.P., which is a simple solution of iodine in alcohol. It is used only for external application. Some time last summer, my clerk suggested that it might be made from methylated alcohol, and, contrary to usual custom, I consented to make trial of half a gallon. After preparation it was carefully examined, and it seemed as if the odour of methyl alcohol was entirely covered by that of iodine, and, in no other respect did it seem to differ from the same tincture made with ordinary alcohol. For a time all went well, but, at the end of about a month, a patient complained that he could not use it on his knee, because "it burnt him and made his eyes smart when he was applying it." This complaint was disregarded, but soon there were more of the same kind, and we then concluded to withdraw it from general sale, and confine it to veterinary practice. Before this happened, however, a physician had got hold of some of the tincture, which he used in his gynecological practice, causing to his patient a few minutes of intense suffering, and three or four days confinement to a recumbent position, from the very great soreness produced by the application. I have just examined the last few ounces of this tincture, and on pouring out the liquid, the extremely pungent fumes filled the whole store, causing the eyes of both clerks and customers to water very freely. So pungent was it that although the day was cold and blustering, we were compelled to open all the doors and thoroughly ventilate the place.

At first I was inclined to think that the formation of a small quantity of iodide of methyl might account for the great pungency developed, but soon abandoned that theory and had laid the matter over for further consideration and experiment. I am now convinced that Mr. MacEwan has struck the key-note when he suggests that allyl alcohol may be present, which unites with the iodine to form some iodo-allyl compound. In confirmation of this it may be stated that the odour of the tincture was decidedly "garlicky," and the effect upon the nose and eyes very similar to that of oil of mustard, but more powerful. Mr. MacEwan states that he prepared some iodine liniment, omitting the camphor, and found that the pungency was not produced, arguing from this experiment that the camphor had in some way influenced the development of pungency. It will be seen, however, that my experience establishes the fact that camphor has nothing to do with the reaction.

In view of the above facts it would be interesting to inquire if a certain brand of "crystal methyl" has entered, to any extent, into the composition of tinctures and other pharmaceutical preparations, and what the chemical and therapeutical results of such a course are likely to be. It is well known that it has been much pushed and recommended as having scarcely any more odour than ordinary alcohol.

Should time and opportunity be afforded me I will endeavour to follow up this subject by such experiments as the busy avocations and slender resources of a country pharmacy will permit.

* From the *Canadian Pharmaceutical Journal*, June, 1883.

KEFIR, A NEW MILK-FERMENT.*

Whilst, during the last few years koumiss has been introduced into Western Europe, and even into America, a new drink prepared from cow's milk by a process of fermentation imperfectly understood is coming into use in Russia. This drink is kefir, and it has for long formed the chief article of diet among the mountaineers in the neighbourhood of Mount Elbruz and Kasbek, in the Caucasus. It forms a thick white fluid, with a faintly acid flavour, said to resemble certain light wines. The mountaineers themselves call it "ghippo." The inhabitants of the plains near the Caucasus, and the Russian settlers, who term it kefir, kifir, or khiafar, make use of it, not for the table, but as a popular remedy for anæmia, struma, gastric catarrh, and chronic bronchitis. According to the Moscow *Medical Gazette*, where a contribution on the subject has recently appeared, Dr. Kern being the author, the preparation of kefir is very simple. The mountaineers make it by filling a bag made of goat-skin with milk, then a tenacious mass, of the size of a walnut, of a material which they term "kefir-seed," and the precise origin of which is unknown, is added to the milk. In a few hours the process of fermentation sets in actively. When prepared in wooden or glass vessels, the kefir tastes better. After a lapse of twenty-four hours a weak kefir is produced; when the process is allowed to continue for three days, the kefir becomes very strong. The source of the ferment is scrupulously concealed by the Caucasian mountaineers, who, with the humour of the English cook who once sold a secret for making "fundied cheese," the "secret" being that, the cheese must be fundied after toasting and before the addition of pepper, cannot be persuaded to enlighten strangers to any greater extent than in supplying a small sample of the ferment, in the form of dry dark-brown earth-like masses, but steadfastly refusing to say whence they are obtained. One of these fragments dropped into milk begins rapidly to effervesce, turns milk-white, and assumes the form of a mulberry, then fermentation proceeds at once. If a piece, thus transformed, be dropped into another bowl of milk, it rapidly increases in size, and also causes fermentation. Dr. Kern has carefully examined specimens of this "kefir-seed," which consists chiefly of masses of zoogloœa, holding together collections of a bacterium which he calls *Dispora Caucasica*. The yeast-fungus, *Saccharomyces cerevisiæ*, is always found associated with this new germ. "Kefir-seed" retains its vitality after remaining for months in its dry condition. Dr. Kern has a great belief in the future of kefir, which has all the virtues of koumiss, and possesses one great advantage over the latter fluid, in that it is just as good when prepared from cow's as from mare's milk.

* From the *British Medical Journal*, May 12.

The Pharmaceutical Journal.

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THE FORTY-FOURTH ANNUAL REPORT OF THE REGISTRAR-GENERAL.

ALTHOUGH just a year and a half has elapsed since the close of the period to which the Report of the Registrar-General just issued refers, the delay finds a full explanation in the elaborate tables by which, like its predecessors, it is accompanied. To one section of these, the tables relating to the deaths during the year 1881, it will not be out of place to make reference in these columns, not only because they convey some important information as to the result of the increased interest in sanitary measures which has become developed in this country during recent years, but also they incidentally disclose the extent to which the wilful or intentional use of poisons is known to have led to fatal results. This latter subject at least may be assumed to present some points of special interest to the readers of this Journal, but before referring to it further we purpose mentioning some facts of more general interest as relating to the effect of recent sanitary legislation on the public health.

The year 1881 may be said to have completed a decade since the Public Health Act came into operation in 1872, and nothing stands out more distinctly and unmistakably in the series of reports issued during these ten years from the Registrar-General's office than the wonderful effect which recent sanitary operations have had in saving life. This is shown by the fact that the deaths registered in England and Wales in 1881—which numbered 491,935—were, notwithstanding the increased population, absolutely fewer than in any of the preceding twelve years. In 1877, the year when the lowest previous death-rate occurred, the deaths were in the proportion of one to every forty-nine persons living; but in 1881 only one person died out of each fifty-three living. Or, to spread the comparison over a longer period, in the ten years of 1862 to 1871 inclusive the death-rate had been 22·6 per 1000, and there were no indications of a tendency to fall lower, the average being exactly reached in the last mentioned year. But upon the Public Health Act coming into force, the death-rate at once commenced to fall and continued to abate every year, with one exception, until 1881, when it was only 18·9 per 1000. The exception was in 1875, when the rate was 22·7 per 1000. In that year, however, a second and more stringent Act came into force, and from that time until 1881 the death-rate in no year reached 22 per 1000, the average being only 20·5.

This decline in the death-rate has been shared by the population in all parts of the country, by both sexes, and by persons of every age, and the Registrar-General argues, very reasonably, we think, that as the improvement has now been maintained through a series of years, it can hardly be attributed, even by the most sceptical, to a succession of seasons favourable to health. Indeed, he claims that the saving in life is the direct return for the money and labour expended in sanitary improvements, and he enters into some calculations as to the *quid pro quo* which the country has already received for its enormous expenditure in this direction. Briefly stated, his conclusions, after eliminating as far as possible disturbing influences, are that in the year 1881 alone about 92,000 lives were saved, and—assuming that for every fatal case of illness there are four or five that end in recovery—probably nearly half a million cases of illness were avoided; whilst extending the estimate over the ten years from 1872 to 1881 inclusive, he states that nearly four hundred thousand persons were living in England and Wales at the end of the year 1881 who would probably have died before that time had the old *régime* continued. It is important to note that this improvement has not been equal during the ten years, but has on the whole shown a progressive rate of increase throughout that period.

Pharmacists, who have had special opportunities of watching the tendencies of modern medical practice, will not be surprised to learn that by far the largest decrease in the death-rate has been manifested in connection with the classes of zymotic and parasitic diseases, and this is of course quite consistent with the claim put forward as to the beneficial results from improved sanitation. In the important zymotic class, with few exceptions,—the most important being diphtheria, which reached the mean rate of the previous decade,—the reduction extended to every class. Enteric fever fell from a mean of 326 per million to 218; typhus from 58 per million to 21; and other or ill-defined forms of continued fever from 105 per million to 44. Measles, scarlet fever and whooping cough showed a great diminution in fatal cases, whilst although the mortality from small-pox, owing to the outbreak in London, was greater than it had been for some years, it did not reach the decennial average. Deaths from diarrhœa, dysentery and cholera were also far less numerous, but this was probably owing to the absence of long continuance of hot weather in the summer of 1881.

In the class of "Violent Deaths" no less than 569 fatal cases of poisoning are recorded as having occurred in England and Wales during the year

1881, 368 of the victims having been males and 201 females. This class is subdivided into "Deaths from Accident and Negligence," of which there were 220 amongst males and 120 amongst females, and "Deaths by Suicide," of which there were 147 among males and 81 among females; only one case of murder by poisoning is recorded as having taken place in 1881. It should be mentioned, however, that a considerable number of the deaths attributed to poisoning through "accident or negligence" were probably the result of employment in some noxious calling, the deaths of as many as 52 males and 14 females being referred to lead poisoning. Of course also the number of cases referred to poisoning by alcohol is capable of being largely modified according to the views held by juries upon the drink question. As might be expected opium and its preparations were the most frequent agents in the accidental deaths of both sexes; they were also used most frequently in cases of suicide by males, but carbolic acid was the poison used for the purpose of self-destruction most frequently by females. In fact carbolic acid was the cause of death in 50 cases, or nearly 1 in 7 of all the fatal cases of poisoning during the year. The deaths by poisoning were in the proportion of 1157 to each million of total deaths from all causes, and compared with the number living of each sex, they were 29 to each million of males and 15 to each million of females. One other point worth mentioning, respecting the cases of suicide by poison, is that the largest proportion occurred among males between the ages of 35 and 45, and among females between the ages of 15 and 20.

The following statement, condensed from the several tables, will show at a glance the various poisons to which death has been attributed and the number of fatal cases in the two sexes referred to each, the accidental deaths being also distinguished from the suicides. The deaths from the vapours of chloroform and ether, which numbered 22 and 7 respectively, only one being a suicide, are classed under another head in the Report.

Name of Poison.	Total No. of Deaths.	Accident.		Suicides.	
		Male.	Female.	Male.	Female.
Arsenic	10	2	—	6	2
Mercury	6	3	3	—	—
Lead	66	52	14	—	—
Barium Chloride	1	—	1	—	—
Potash	1	—	—	1	—
Ammonia	7	4	2	—	1
Solution of Caustic	1	1	—	—	—
Caustic Soda	2	—	2	—	—
Sulphuric Acid	4	1	1	1	1
Sulphurous Acid	1	1	—	—	—
Hydrochloric Acid	12	5	—	6	1
Nitric Acid	3	2	1	—	—
Carbolic Acid	50	10	7	15	18
Oxalic Acid	16	—	1	7	8
Prussic Acid and Oil of Almonds	24	3	1	19	1
Potassium Cyanide	22	6	—	15	1
Acetic Acid	1	1	—	—	—
Benzoline	1	1	—	—	—
Alcohol	20	18	1	—	1
Chloroform	2	—	1	1	—
Chloral Hydrate	20	9	6	4	1
Croton Chloral	1	1	—	—	—
Chlorodyne	8	3	4	—	1
Opium, Laudanum, Morphia	129	53	37	33	6
Paregoric	2	1	1	—	—
Syrup of Poppies	1	1	—	—	—
Godfrey's Cordial	2	1	1	—	—
Anodyne Cordial	1	1	—	—	—
Stothert's Soothing Syrup	1	—	1	—	—
Dalby's Carminative	1	—	1	—	—
Balsam of Horehound	1	—	1	—	—
Aniseed	1	1	—	—	—
Steadman's Powders	1	1	—	—	—
Belladonna	7	4	1	1	1
Aconite	4	1	3	—	—
Hemlock Dropwort	1	1	—	—	—
Arum Maculatum	1	—	1	—	—
Yew Berry	1	—	1	—	—
Digitalis	1	1	—	—	—
Unripe Fruit, Berries, etc.	4	3	1	—	—
Tobacco	3	1	2	—	—
Strychnia, Nux-Vomica	21	1	4	7	9
Phosphorus	15	1	6	3	5
Vermin Killer	9	—	—	9	—
Camphor	1	—	1	—	—
Cantharides	1	—	—	—	1
Poisonous Meat and Fish	2	2	—	—	—
Turpentine	2	1	1	—	—
Paint	1	1	—	—	—
Condy's Fluid	1	—	1	—	—
Washing Liquor and Carson's Detergent	2	2	—	—	—
Overdose of Medicine	2	2	—	—	—
Kind of Poison not stated	70	17	11	19	23

It is evident from the foregoing table that, probably owing to want of precision in the returns made by coroners, at present very little uniformity obtains in the method of classification of deaths by poisoning. Thus as many as 129 cases are huddled together under the head of "opium, laudanum, morphia," whilst a few others in which a preparation of opium was no doubt the noxious ingredient are set out in detail. Again it seems very likely that most of the cases of poisoning by phosphorus and by strychnine have more in common than is indicated by the classification under three different heads. But the least satisfactory feature is the return of no less than 70 cases, or about one-eighth of the whole, without the kind of poison being stated, which suggests that either many juries are satisfied with a modicum of evidence or the responsible officials are very chary as to the amount of information they transmit to the Registrar-General.

The second reading of the Medical Acts Amendment Bill was adjourned from Thursday the 21st until Thursday the 28th inst., when it was the thirteenth order of the day.

* * *

We learn from a statement in an evening newspaper that on Wednesday afternoon an assistant in a chemist's shop in Partick was apprehended in connection with the death of a young man from poison, apparently the case referred to in this Journal last week, but up to the time of going to press no report of the proceedings has reached us.

* * *

Some little time ago several "druggists" were charged before the Grenoble "tribunal correctionel" with a breach of the law which in France restricts the sale of simple drugs in medicinal quantities, pharmaceutical products and specialties to pharmacists. The case having been dismissed in respect to the sale of specialties, the decision has been the subject of an appeal in the interest of the pharmaceutical fraternity. It was pleaded by the defendants that specialties constitute secret remedies, the sale of which by pharmaciens is illegal; but the Court held that they are as a rule only modifications of official preparations, coming within the definition of pharmaceutical preparations, and therefore imposed upon each offender a fine of five hundred francs. The decision has naturally given great satisfaction to the pharmaciens.

* * *

Fortunately it does not often fall to our lot to have to chronicle the death in one week of two men of such high scientific attainments as General Edward Sabine and Dr. William Spottiswoode, the former an Ex-President and the latter actual President of the Royal Society, and both of them past Presidents of the British Association. Sir Edward Sabine died on Tuesday, at Richmond, in his ninety fifth year, and Dr. Spottiswoode on Wednesday, in London, aged fifty-eight.

* * *

The last number of the *British Medical Journal* contains a series of three reports on the subject of arsenical poisoning. The first is by Dr. T. Lauder Brunton on the evidence regarding the injurious effects on health arising from arsenical wall-papers and other articles containing arsenic, which although at present somewhat limited he considers sufficient to justify vigorous action. The second report is from a committee of the National Health Society appointed to consider the subject of the occurrence of arsenic in domestic fabrics. It deals especially with the limits to the amount of arsenic which should be fixed by legislation, and the standard test for its detection which should be adopted, the one recommended and described being a modification of Marsh's test. The last report, by Dr. Stevenson, is on the behaviour of arsenic in contact with putrefying organic substances, in which the writer explains that the reason why in some cases highly arsenical papers have been used without injury to health, whilst in others papers containing much less arsenic have produced distressing consequences, may be that sometimes volatile arsenical bases are formed similar to those which Professor Selmi has found in the corpses of persons who had died from arsenical poisoning.

The chemists and druggists of Toronto have just escaped in a fairly creditable manner from the operations of the city analyst. Twenty-three samples were obtained, including potassium iodide and bromide, cream of tartar, sodium bicarbonate, powdered acacia and powdered rhubarb. The analyst reported to the Dominion Inland Revenue Department that all the samples, when analysed, proved to be pure, except the powdered rhubarb, which contained flour; but even about this sample there was evidently some doubt, as the analysis is to be repeated.

* * *

If official recognition could secure success the Executive of the International Pharmaceutical Exhibition at Vienna are entitled to congratulation. We learn that the Archduke Karl Ludwig, who had consented to allow his name to be used as patron of the exhibition, has now, upon his return from Moscow, accepted an invitation to conduct the opening ceremony. The Executive Committee has also received an intimation from the Minister of Public Worship and Instruction that Professor Dr. Aug. Vogl will be deputed to represent the department on the larger Exhibition Committee.

* * *

According to the *Brooklyn Eagle*, whilst a "clerk" in a drug store at Sag Harbour was putting up a prescription including chlorate of potash and tannic acid the mixture exploded and burnt his eyes and face very badly.

* * *

In the "annual museum" held in connection with the forthcoming meeting of the British Medical Association in Liverpool, there will be, as usual, a section devoted to the exhibition of "new chemicals and apparatus, new drugs and their preparations, and new articles of diet for invalids." Applications for space by intending exhibitors of drugs, etc., should be made as soon as possible to Dr. T. Bushby, Clarence Street, Liverpool.

* * *

In a letter to the *British Medical Journal* last week, Mr. J. Dale, of Stockton-on-Tees, suggests that no person, however superior his attainments, who keeps an open shop in which he sells hair oil, tooth-brushes, etc., should have his name included in the Medical Register.

* * *

According to a return just presented to the House of Commons the quantity of coal exported from British and Irish ports to foreign countries and British Settlements abroad during the year 1882 was 19,926,011 tons, of the declared value of £8,954,448. Besides the coal there were 466,249 tons of cinders and 542,188 tons of patent fuel exported. The largest exports were from Cardiff, closely followed by Newcastle, the two ports sending away between them one half of the whole, whilst among the customers France, Germany, Italy and Russia rank in the order in which they are named.

* * *

The Albert Medal of the Society of Arts for "distinguished merit in promoting arts, manufactures or commerce," has this year been awarded to Sir Joseph D. Hooker, the eminent Director of the Royal Gardens at Kew.

Provincial Transactions.

HAWICK PHARMACEUTICAL ASSOCIATION.

The above Association held its first general meeting since its formation, in the Chemical Laboratory, Oliver Place, on Tuesday, 19th inst., Mr. Maben, Hon. President, in the chair.

The minutes of the former meeting having been read and approved, the Secretary intimated the following donations for the museum and library:—From Mr. J. C. Waldie, New York (formerly of Hawick): a series of specimens of capsules, capsulets, capsuloids and empty capsules; thermaline, a substitute for quinine, and seidlitine. From the Hon. President: Attfield's 'Chemistry;' Bell and Redwood's 'History of Pharmacy;' Gladstone's 'Life of Faraday;' and Kingzett's 'Animal Chemistry.'

A vote of thanks having been passed to the respective donors, the President, Mr. John Grieve, read a paper on "Evolution and Natural Selection."

At the outset of the paper, in which the subject was treated in an erudite and comprehensive manner, the essayist said that, though the idea of evolution had occurred to many minds, to some even so far back as twenty-five centuries ago, it was not until Darwin furnished the simple solution of natural selection to account for the origin of species that the evidence of descent obtained a *locus standi*. The remains of human bones, and implements fashioned by human hands found in caverns, etc., along with the bones of extinct animals, pointed to a remote antiquity, and anthropology proved that the earlier man had existed, the more savage and degraded was his condition. Man's development, in which a repetition of his descent might be traced, and his possession of rudimentary organs, which are the homologues of those structures that perform some observable functions in those animals which have them more perfectly developed, were adduced as evidences of his origin from the lower animals. The connections between certain distinct groups of animals were described, and the likeness existing between them explained on the ground of heredity, and the unlikeness as due to variation. In the development of animals there was clearly presented a picture of their descent, as all animals, in their successive embryonic stages, progressively imitated very closely those animals lower in the scale of creation. Natural selection was afterwards dealt with, and was stated to be the law of nature which determined those changes of structure which would be of advantage to the organism in adapting it to its environment, and which transmitted those advantageous characters. The ways in which natural selection acted, in connection with the survival of the fittest, were explained, and the essayist finally dealt in a critical manner with the objections most commonly advanced against Darwin's theory, including that of primogeniture.

A vote of thanks having been awarded to Mr. Grieve, a discussion took place in which several of the members took part.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

A meeting of this Society was held on Thursday, June 21, Dr. W. H. Perkin, F.R.S., President, in the chair.

A ballot was held, and the Scrutators, Dr. Thorne and Mr. Meldola, declared the following gentlemen duly elected Fellows of the Society:—G. S. Bowler, C. Beringer, T. H. Coleman, A. Esilman, H. E. Harrison, C. Hulke, H. Heap, B. Hobbs, C. T. Heycock, W. J. Livingstone, B. P. Lascelles, H. R. Mill, M. F. Purcell, J. E. Richardson, F. G. Roberts, W. R. Riffell, A. Smith, E. H. B. Stephenson, A. W. Soward, A. H. Samuel, D. Wilson, R. Williams.

The President then called on Professor McLeod to read a paper—

On Evaporation in Vacuo.—The ordinary method of evaporation *in vacuo* over sulphuric acid is very slow, for three reasons: the aqueous vapour reaches the surface of the acid by diffusion only, the surface of the sulphuric acid is limited, and as the dilute sulphuric acid floats on the concentrated acid, the absorption of aqueous vapour is much retarded; lastly, heat is supplied but slowly to the evaporating liquid, being almost entirely that reaching it by radiation. In one experiment 50 c.c. of water placed *in vacuo* over 250 c.c. of sulphuric acid required two and a quarter days for complete evaporation. The author was led to try some experiments on the evaporation of water at low temperatures by some remarks of Professor Mallet (*Chem. News*, xlvi., 62, 73, etc.), and the method was suggested by Wright's apparatus for distillation of mercury (*ibid.*, xliv., 311); a somewhat similar apparatus is described by Mallet (*ibid.*, xlvii., 218, 252). The author used a Körting's jet pump to produce the vacuum. In one form of apparatus the water was evaporated in a glass dish with ground top which pressed a red indiarubber ring against a brass ring soldered to a copper dome. The aqueous vapour was condensed in a copper vessel consisting of a truncated cone within a cylinder. The tube by which the water to be evaporated is supplied ends in a small glass funnel, the mouth of which touches the inside of the dish. The dish is surrounded by a water-bath at 50°; the temperature of the water in the dish was found to be 26°. 50 c.c. of water can be evaporated in two hours. Instead of the dish, the author has used a wide test tube or a combustion tube, so that the water residue can be evaporated in the tube afterwards used for effecting its combustion. In another modification, described by the author, the condenser is replaced by a wide vertical tube, down the inner surface of which a thin layer of sulphuric acid is allowed to flow; the aqueous vapour is thus rapidly absorbed, and passes down the fall tube as dilute sulphuric acid. It is necessary to cool the sulphuric acid by a flow of cold water. The author exhibited this apparatus at work, and incidentally described a useful valve for preventing the loss of a vacuum, which occurs when using Körting's pump if the water pressure be suddenly diminished. The stream of water passes down a narrow glass tube into an elongated bulb, from the bottom of which it issues by a T piece. In this bulb floats a piece of glass tube filled with air and closed at both ends so that it just floats in water. The upper end of this float is ground, so that if the water stream stops, the float rises and stoppers up the narrow glass tube; the vacuum is thus preserved.

Mr. Thorp said the paper was of great interest to water analysts; he was afraid that it might be difficult to mix the water residue in the combustion tube perfectly with oxide of copper, and there seemed to him a possibility of the introduction of small pieces of indiarubber.

Dr. Roscoe then communicated a paper—

On the Preparation of the Pentathionates. By S. Shaw.—Professor Spring (*Annalen*, 213 [3], 329) expresses doubts as to the existence of pentathionic acid and the pentathionates, and especially combats the statements of Lewes (*Chem. Soc. Journ.*, March, 1881), who prepared and analysed the potassium and barium salts. The author therefore repeated Lewes's work and has been able to confirm completely his results. He has succeeded in preparing perfectly clear transparent crystals of potassium pentathionate which can be recrystallized; these differ in form from the tetrathionate, give a white precipitate of sulphur when treated with caustic potash, and on analysis proved to contain two atoms of potassium to five of sulphur.

Appended to this paper is a—

Note on Pentathionic Acid. By Watson Smith.—In it it is proved that Wackenroder's solution prepared with excess of sulphur dioxide does not bleach dilute indigo solutions. When to half neutralized Wackenroder solution caustic potash is added no precipitate is produced, because in the presence of free sulphurous acid thiosulphate is formed. If, however the solution be evaporated

the sulphur dioxide is expelled and the sulphites and thiosulphates are decomposed; a liquid is then obtained which gives with caustic potash a precipitate of sulphur from the decomposition of the pentathionates.

Dr. Debus said that Mr. Lewes was still working at the subject and had obtained crystals of potassium pentathionate more than an inch in length. The pentathionates could only be prepared and recrystallized from acid solutions. If one-half of a solution was neutralized and the other half added, the pentathionates were decomposed. The quantity of base required must be calculated and then added to the acid solution.

Dr. Armstrong then read a—

Note on Hydrocarbons from Camphor. By Dr. Armstrong.—The author in a previous communication of December 1877, announced that he was engaged in an examination of the mixture of hydrocarbons produced by the action of several of the so-called dehydyating agents on camphor. Owing to the complex character of the product, the time occupied in fractional distillation, etc., but little progress had been made in the research; during the last few months, however, the author has in conjunction with Dr. Miller repeated the whole of the previous work on a very large scale, and satisfactory methods of separation have been devised so that it will soon be possible to publish a complete account of the investigation. An exhaustive study has been made of the actions of phosphoric anhydride, phosphorus pentasulphide, zinc chloride and of iodine. The author gave some account of the action with zinc chloride; after describing the methods of operating and separating the products, he stated that in the main C_{10} compounds are produced under the conditions which have been maintained in carrying out the reaction. The phenol produced is carvacrol, and the chief constituents of the hydrocarbon mixture are $C_{10}H_{20}$ and two $C_{10}H_{14}$ hydrocarbons; relatively small quantities of both higher and lower homologues of $C_{10}H_{14}$ are also present, together with one or more hydrocarbons which are carbonized by sulphuric acid, and are not yet satisfactorily identified. The two $C_{10}H_{14}$ hydrocarbons are isomers of cymene; the barium salt of one of these is almost insoluble in water, the sodium salt crystallizing with one molecule of water in large nacreous plates; the barium sulpho salt of the other hydrocarbon is easily soluble and closely resembles ordinary barium cymene sulphonate, with which previous observers have identified it. For a long time the author of the present note was similarly mistaken; the salt, however, contains $3\frac{1}{2}$ molecules of water of crystallization, and is convertible into a magnesium salt which is highly characteristic, and is altogether different from ordinary magnesium cymene sulphonate. Although two other easily soluble barium sulpho salts derived from $C_{10}H_{14}$ hydrocarbons have been isolated, one crystallizing with 9 molecules of water in long flat prisms, the other with $7\frac{1}{2}$ molecules in small glistening plates, no indication of the presence of ordinary cymene in the product from the action of zinc chloride has been obtained. A not inconsiderable quantity of camphorone, $C_9H_{12}O$, is also produced. The product of the action of iodine on camphor does not contain cymene, but yields the sulpho salt resembling that of ordinary cymene referred to above.

In answer to Dr. Tilden, Dr. Armstrong said that he was quite satisfied that the hydrocarbons were $C_{10}H_{14}$, and not $C_{10}H_{16}$ hydrocarbons.

Mr. V. H. Veley then read a paper—

On the Rate of the Decomposition of Ammonium Nitrate.—The author has carefully measured the rate at which gas is evolved by heating pure ammonium nitrate at a constant temperature. He has arrived at the following conclusions:—That the rate of decomposition into nitrous oxide and water is dependent, not only on the mass of the salt, but on the proportion of free nitric acid present. If the reaction of the salt be rendered alkaline, the rate gradually increases as the proportion of free acid increases; a period of maximum velocity is then reached corresponding to the greatest proportion of free acid; the rate then slowly decreases with the decrease of free acid. An excess of ammonia completely stops the reaction, even when the temperature is raised 50° or 60° above the normal temperature of decomposition. If the reaction of the salt be rendered acid at starting, the rate of decomposition gradually decreases as the acid decreases. After heating the salt for thirteen to sixteen hours the rate of change becomes practically constant. The apparatus used in the research was exhibited, and the method illustrated before the meeting by the author.

Professor Ramsay then shortly described and exhibited a new gas burner for heating combustion tubes. The burner consists of a Bunsen burner, on the top of which fits a brass T piece, the top of the T is about 6 inches long and 1 inch in diameter. It has a longitudinal slit cut in it on the top; the ends are closed by pieces of sheet brass which are arranged so that they support the tube to be heated. By a simple arrangement any third of the slit can be closed or opened. A series of these tubes can be connected together by a bayonet catch, so that any length of tube can be supported and heated. The tube is covered by a length of asbestos cardboard. The principal advantages are that the arrangement is cheap and cools quickly, so that seven combustions can be performed in a day.

The two following papers were taken as read:—

Note on the Action of Allylic Iodide upon Phenol in the Presence of Zinc or Aluminium Foil. By P. F. Frankland and T. Turner.—A colourless liquid was obtained boiling at 223° to 225°; it proved to be orthopropylphenol.

On a Bye-product of the Manufacture of Aurin. By A. Claparède and Watson Smith.—When aurin is prepared from phenol, oxalic acid and sulphuric acid, a quantity of white crystals are formed on the lids of the aurin pots. The authors have purified and analysed these crystals, which consist of a phenylortho oxalic ether, $C=(HO)_2$ / $\backslash OC_6H_5$ / $/OC_6H_5$ / $C=(HO)_2$. This substance melts at 123° to 124°; it is formed when phenol and anhydrous oxalic acid are distilled together.

The Society then adjourned over the summer recess.

CHEMISTS' ASSISTANTS' ASSOCIATION.

At a Council meeting, held May 30, the following officers were elected for the coming session:—Mr. C. Parkinson, President; Messrs. J. C. Braithwaite and H. H. Millhouse, Vice-Presidents; Mr. J. Hills Hartridge, Honorary Treasurer; Mr. W. Temple Cooper, Junr., Honorary Secretary; Mr. H. Cracknell, Honorary Assistant Secretary and Librarian.

The Council decided to open the rooms of the Association on the following Wednesday evenings during the summer months at nine o'clock:—June 20, July 4 and 18, August 1, 15 and 29, September 12 and 26. The Council having subscribed to Mudie's Library, members will be able to obtain books, other than works of fiction, mentioned in Mudie's Catalogue, a copy of which is kept at the rooms, on those evenings on which the rooms are open, subject to the rules drawn up by the Council, a copy of which will be fowarded to each member.

ROYAL INSTITUTION OF GREAT BRITAIN.

The Ultra-Violet Spectra of the Elements.*

BY PROFESSOR GEORGE D. LIVEING, M.A., F.R.S.

It seems probable that the range of our vision as regards colour is closely connected with the intensity of that part of the solar radiation which reaches us on the earth, for Langley's observations on the intensity of the sun's rays in different parts of the spectrum bring out the fact that the region of greatest intensity falls nearly

* Read Friday, March 9, 1883.

in the middle of the visible spectrum, and includes those colours to which our eyes are most sensitive. The ultra-violet rays, those which lie beyond the violet on the more refrangible side, are not, however, absolutely invisible, for, by carefully excluding light of lower refrangibility, Herschel found that he could see some distance beyond the Fraunhofer line H, into what he called the lavender-grey; and Helmholtz has succeeded in seeing nearly all the strong lines in the solar spectrum almost or quite up to its limit. Still these rays may fairly be said to be beyond ordinary vision; and from their power of chemical action they used to be distinguished as "actinic" rays. We know now that they have no monopoly of chemical activity, and we recognize no difference between luminous and actinic rays, the visible and the ultra-violet, except in their oscillation frequencies; that is, in the rate at which the successive pulsations of the ray succeed one another, and in the colour and refrangibility which are directly dependent on that rate. That the ultra-violet part of the solar spectrum extended at least as far above the line H as F is below it, has been known since the time of Wollaston, who observed its effect in blackening silver salts; but it is only about twenty years since Stokes made known to us the great length and intensity of the ultra-violet spectrum of the electric spark. Stokes used his own invention, a fluorescent screen, for observing the rays; and at the very time when Stokes published his discovery, W. A. Miller published photographs of the spectra of sparks taken between various metallic electrodes. Both these methods, that of fluorescent screens and that of photography, have been used by Professor Dewar and me in our researches. For the method of fluorescence we have used a modification of Soret's eye-piece, substituting for the uranium glass-plate a wedge-shaped vessel full of a solution of æsculine, placed with its edge horizontal so that we look down on the fluorescent liquid. The wedge form of the vessel has the advantage of refracting out of the line of vision all the rays except those which produce fluorescence, a matter of no small importance when faint light is to be observed.

Now, although the intensity of the sun's rays falls away rapidly beyond the Fraunhofer line H, and comes to nothing about as far above H as F is below it, it is far otherwise with the radiation of our terrestrial elements when heated up in the electric spark or arc, or even in some cases in flames; some of those elements which we know to be abundant in the sun, such as iron and magnesium, exhibit their most intense radiation, their strongest and most persistent rays, in the ultra-violet region, in waves which succeed one another at the shortest intervals. Indeed those metals so readily take up certain ultra-violet vibrations, that when there is much metal in the arc, and it is confined in a crucible of lime or magnesia, they often give their characteristic lines strongly reversed, dark absorption-bands being produced by the slightly cooled vapour which is outside the arc. The spectrum of iron is of all metals the most complicated, and those of the other elements which are most closely related to iron in chemical characters come next to it in the number and complication of their ultra-violet lines. Manganese and chromium are especially remarkable for showing many groups of closely-set lines. It is probably not without significance that this group of elements which exhibit the greatest variety in their chemical relations, and produce combinations of the greatest number of types and the most complicated spectra, are also those which produce the most highly-coloured compounds. In marked contrast to the thick-set ranks of iron, manganese, and chromium lines, are the few scattered rays exhibited by those metals which form their combinations each chiefly on a single type, such as aluminium, and the alkali and alkaline earth metals. These spectra are probably even simpler than at first sight they seem to be. That of lithium is the simplest: a series of single lines succeeding one another at decreasing intervals, and with diminishing intensity, closely resembling in these respects the spectrum of hydrogen. In the case of hydrogen, we know that the oscillation frequencies of some of its rays are related in a simple harmonic ratio. We are not able to say that the relation is so simple in the case of lithium; but still the whole series are probably overtones of a fundamental vibration, not so simply related as the harmonics of a uniform stretched string, but, like the overtones of a string which is not of uniform thickness, or is loaded at different points, similarly related in origin, though not exact harmonics. That the different rays are in many cases so related as overtones of a fundamental vibration appears more plainly, perhaps, when not single lines but groups of two, three, or four lines recur. Potassium shows a series of pairs to which the well-known violet pair, and perhaps that in the red also, belong. Calcium, magnesium, and zinc, each show a series of triplets, which are alternately sharply defined and diffuse. In other cases the same characters may be traced, though less readily, because there is sometimes more than one such series of lines or groups. The alkali metals have each one such series in the visible spectrum, and another in the ultra-violet. It may happen in other cases that two or more such series overlap, and it may then be very difficult to distinguish and separate them.

In some cases elements show at a lower temperature a far more complicated spectrum than they do at higher temperatures further removed from their points of liquefaction. This has been observed by Roscoe and Schuster in the case of the alkali metals potassium and sodium, which give at temperatures only a little above their boiling-points absorption spectra which consist of closely-set fine lines, producing an appearance of shaded bands quite unlike their emission spectra at higher temperatures. In some few cases we have observed similar "fluted" or "venetian blind" spectra, as they have been called, in the ultra-violet, as, for example, one produced by tin; but in general the temperature of the arc, which we have chiefly used in our observations on metals, is high enough to carry the metals beyond the stage in which their vibrations are constrained by the state approaching to liquefaction.

But though metals do not often show spectra of this class at the high temperature of the arc, it is otherwise with metalloids and with compounds. Nitrogen gives in the arc as well as in the spark a channelled spectrum of singular beauty, extending with but short breaks almost to the extremity of the ultra-violet region which we have examined. These multitudinous lines of nitrogen constantly present in the arc taken in air, help to make the problem of unravelling the spectrum of the arc, and assigning each line to its proper source, far more difficult than it might at first sight be supposed. Carbon, which in the arc frequently gives a channelled spectrum in the visible region, gives only a limited number of lines in the ultra-violet; but cyanogen gives one set of flutings near the line L, and another near N, which are so brilliant in the arc as to obscure the metallic lines in their neighbourhood. To the same class we may refer the spectrum of water.

The series of lines produced by the same element, which I have spoken of as overtones of a fundamental vibration, have been likened to these channellings, but in reality they are very different. In the series, which I have supposed to have a sort of harmonic relation, the successive lines or groups of lines invariably become nearer to one another as the wave-lengths become shorter, and at the same time they diminish in strength and sharpness; whereas in the channelled spectra the strongest lines are at the end where they are most closely set, and they generally diminish in strength as they get further apart. Also increase of distance between the lines of channelled spectra is sometimes towards the less, sometimes towards the more, refrangible end of the spectrum.

I have before observed that a great part of the ultra-violet spectra of the elements which we have observed

lies entirely beyond the limit of the solar spectrum; that limit is the line U at wave-length 2947. But though this is the limit of the solar radiation which reaches us on the earth, we can hardly suppose that the sun itself, or the photosphere, emits no radiation of shorter wave-length. We know there is plenty of iron and magnesium in the sun, and the strongest radiations at high temperatures of these elements are of shorter wave-length than U. Moreover, the continuous spectra of incandescent solids in many cases extend far beyond U. The continuous spectrum of burning magnesium reaches quite up to the wave-length 2380, that of the flame of carbon disulphide mixed with hydrogen and fed with oxygen reaches even further, that of lime heated with an oxyhydrogen blowpipe, though feeble beyond the limit of the solar spectrum, extends up to wave-length 2680. The temperature of the sun cannot be less than that of any of these sources of heat, so that we are forced to suppose that the radiation, more refrangible than U, which leaves the body of the sun, is stopped somewhere either in our atmosphere, or in planetary space, or in the atmosphere of the sun himself. Now Cornu has found that when the thickness of our atmosphere traversed by the sun's rays is diminished as much as possible by taking the sun at its greatest altitude, and making the observation from an elevated station (the Riffelberg), the solar spectrum only reaches to wave length 2932, that is, only a very trifle beyond U. We must therefore suppose that the absorbent substance, whatever it be, is not in our atmosphere. The same reason will lead us to reject the notion that the absorption can be due to matter in planetary space, for it is not easy to suppose that the gases which pervade that space in extreme tenuity can differ much from those in our atmosphere, because the earth in its annual course must pick them up whatever they are, and they must then diffuse into our atmosphere, and we must in time have them in a more condensed state in our atmosphere than in planetary space. The absorbent is therefore probably neither in our atmosphere nor in planetary space, and we must look for it in the solar atmosphere. When we notice how much of the radiation of our terrestrial elements is of shorter wave length than the solar line U, we might almost fancy that the blotting out of the sun's light beyond that point is simply due to an increase in the number and breadth of the Fraunhofer lines. Indeed, we have frequently observed the strong magnesium line, wave length 2852, expanded so that the dark absorption band in its middle reached quite up to U on one side and equally far on the other side, and this, together with such expansion of the strong iron lines beyond as we have occasionally observed, would go a long way towards completely hiding all light above U. But such expansions of iron and magnesium lines, high in the scale of refrangibility, do not occur without a considerable expansion of the lines of the same elements lower in the scale, expansions far exceeding what we actually observe in the Fraunhofer lines. Moreover, the Fraunhofer lines, though dark by comparison with the brightness of the photosphere, are themselves luminous, even bright, when there is no other still brighter light wherewith to contrast them, so that if there were no other absorbent action the solar spectrum would be continued by the emitted rays of the metallic vapours which produce these lines. Probably then the absorbent is something at a lower temperature, higher in the solar atmosphere. A change of temperature may, and in some cases certainly does imply such a change of state that there may be a corresponding change in the particular vibrations which can be most easily taken up.

The metals in the liquid and solid states are so very opaque that we should hardly be able to discern their absorption spectra; nevertheless, in very thin films they are translucent in different degrees. Gold leaf, as is well known, transmits a green light, and we have found that a thin film of gold, chemically deposited on a plate of quartz, is fairly transparent for all the ultra-violet rays, so that its selective absorption is almost wholly of the less refrangible rays. Silver deposited in a similar way produces a very different effect. It is almost wholly opaque, except for one rather narrow band which begins a little below the solar line P, and extends with diminishing transparency to about S. Cornu has before noticed this property of silver, but placed the transparent band at wave length 270 instead of 330. Dr. W. A. Miller has observed that the light reflected by gold is equally distributed all through the ultra-violet, but feebler than that reflected by other metals; while that reflected by silver is characterized by giving a sudden cessation of the photographic image for a certain distance. These characters of the reflected rays he attributed to absorption by the metal.

When we examine the absorption produced by the haloid elements, we find that chlorine absorbs a wide band in the ultra-violet with its centre near the solar line P, extending, when the chlorine is in small quantity, from N to T, increasing in width on both sides when the quantity of chlorine is increased, but still leaving the rays above wave length 2550 unabsorbed.

Bromine vapour shows an absorption band which begins in the visible spectrum, and extends, when the bromine is in small quantity, up to L, and when the bromine is in greater quantity, up to P. From that point, up to about wave-length 2500, the vapour is transparent, but beyond it is again absorbent, the absorption increasing gradually with the refrangibility of the rays.

Iodine vapour, when thin, is transparent for ultra-violet rays, but produces strong absorption in the violet region. With thicker vapour this absorption extends nearly to H, but the vapour is still transparent for rays more refrangible than H.

Lecoq de Boisbaudran has observed that in the spectra of similar elements we may trace a shifting of similar lines, or groups of lines, towards the less refrangible side as the atomic weight is increased. Thus the violet pair of lines given by potassium is represented by an indigo pair in the case of rubidium, and a blue pair in the case of cæsium; and the indigo line of calcium is represented by a blue line in the spectrum of strontium, and by a green line in the spectrum of barium.

We may observe something of the same kind in regard to the haloid elements: the absorption band which in the case of the element of lowest atomic weight, namely chlorine, is altogether ultra-violet, is shifted towards the less refrangible side in the case of bromine, and lies altogether in the visible region in the case of iodine, the element of highest atomic weight.

It is remarkable that bromine in the liquid state and iodine in solution show absorptions quite different from those of their vapours. A thin film of liquid bromine between two quartz plates is transparent for a band which ends just where the transparency of the vapour begins, while the film is opaque for rays both above and below this band. Iodine dissolved in carbon disulphide is also transparent for a certain distance, but the band is shifted to a less refrangible region lying between G and H.

Compound gases and vapours show, as might be expected, various absorptions of ultra-violet rays. The absorbent action of coal gas begins at about the wave-length 2680, and above 2580 it is nearly complete. Sulphurous acid has an absorption band extending from about R (3179) to rays of wave-length 2630, with a weaker absorption extending some way beyond these limits on both sides. Sulphuretted hydrogen produces a pretty complete obliteration of all rays above wave-length 2580. Vapour of carbon disulphide in very small quantity produces an absorption extending from P to T, shading away at each end. With more vapour this band widens, and a second absorption band begins at about the wave-length 2580. Chlorine peroxide gives a succession of nine shaded bands at nearly equal intervals between M and S, while in the

highest regions of the spectrum it seems to be quite transparent.

I mentioned at the outset the probable connection between the intensity of the solar radiation and the sensitiveness of our eyes to rays of different colours. The consideration of ultra-violet absorption spectra leads to the mention of another fact connected with vision, or rather with the construction of the eyes of the higher animals. Soret has investigated, and recently Chardonnet has more fully examined, the limits of transparency of the crystalline, cornea, and vitreous humour of the eyes of various animals and man, and found them all more or less transparent for ultra-violet rays. The limit of transparency in many cases approaches, but never exceeds, the limit of the solar spectrum. Chardonnet places the limit of transparency of the crystalline of the human eye as low as M, which is not consistent with the observations of Herschel and Helmholtz before mentioned, but this inconsistency is probably due to alterations which had taken place after death in the eyes experimented on by Chardonnet. That the transparency of the materials of the eye does not extend beyond the solar line U, Chardonnet regards as a provision of nature to protect the retina from the extreme radiations of artificial lights; but I venture to offer a different explanation, which is, that the selection of the materials of the eye has been determined not by what they will absorb, but by what they will transmit. If the materials in question were in any great degree opaque to the ultra-violet solar rays, these rays must be absorbed and must either be used in heating the absorbent, or do work upon it in some form, perhaps alter it chemically, and so impair its efficiency as part of an optical instrument. I see, then, in the selection of these materials for our eyes an instance, one amongst many, of the marvellous adaptation of our organization to the natural, rather than to the artificial surroundings in which we are placed.

Parliamentary and Law Proceedings.

Prosecution of a Chemist under the Sale of Food and Drugs Act.

At the Glasgow Sheriff Summary Court on Friday, June 22, before Sheriff Balfour, William Kennedy, chemist, 59, Trongate, Glasgow, was charged with contravening the 7th section of the Sale of Food and Drugs Act, 1875, through an assistant, for whom he was responsible, dispensing a prescription presented by Robert Inglis, sanitary inspector, on June 4, not in accordance with the specified compounds stated by the prescriber, Dr. Neil Carmichael, 29, South Cumberland Street. The compound was to contain a certain drug, called methyl salicylate, but on an analysis by Dr. Wallace that drug was not found in it.

Mr. Hays, who appeared for the defendant, asked leave to make a statement with the view of inducing the prosecutor to withdraw the charge.

Mr. Ross, who appeared on behalf of the prosecution, said such a course would be irregular before the accused had pleaded to the charge one way or another.

The Sheriff suggested that Mr. Kennedy should plead first.

Mr. Kennedy having pleaded guilty,

Mr. Hays said: Since the complaint was served inquiries have been made and information obtained in regard to the matter complained of. It is understood that the medical prescription referred to in the complaint was prepared by Dr. Carmichael, and the ground of complaint is that the compounded drug contained no methyl salicylate. That statement is substantially correct, and the explanation of the fact is a very simple one. As Dr. Carmichael well knows, the drug methyl salicylate is not to be found in the British Pharmacopœia, and generally speaking is not known in Glasgow; and in point of fact, it is not kept by any chemist in Glasgow. Dr. Carmichael is the only medical man in Glasgow who prescribes it, and it appears to be a drug of American origin, recently discovered; and I find that as late as the month of June last year Dr. Carmichael, at a meeting of the Glasgow Southern Medical Society, called attention to it, and this, I believe, was its first introduction in Glasgow. I also find from Watt's 'Dictionary of Chemistry,' which is a high authority, and also from Dr. Carmichael's paper to the Medical Society referred to, that this methyl salicylate is a volatile oil or essence obtained from the *Gaultheria procumbens*, commonly known as "wintergreen." The plant distilled with water yields an oil consisting of acid salicylate of methyl (90 per cent.), and a terebine (10 per cent.), separable by fractional distillation. When this medical prescription was presented at Mr. Kennedy's place of business Mr. Kennedy was absent. It was handed to his principal assistant, Mr. Slogie, a gentleman of much experience and a most careful and accurate dispenser, and who has been admitted by the Pharmaceutical Society as a competent dispenser of drugs. Mr. Slogie had never heard before of methyl salicylate, and after examining the other ingredients of the prescription, he came to the conclusion that what was really wanted was salicylate of soda. and this he supplied instead of methyl salicylate, which is not kept in stock by Mr. Kennedy, or, it is believed, by any other chemist in Glasgow. Mr. Slogie was assisted in coming to the conclusion at which he arrived by reason of the fact that salicylate of soda, which is a drug extensively used in the treatment of rheumatism, was in complete keeping with the other ingredients of the prescription, which, on the face of it, appeared to him to be intended for the treatment of rheumatism. It will not be denied that this salicylate of soda is quite in harmony with the other ingredients of the prescription. I would call your lordship's special attention to this important point in the case. Keeping in mind what I have already mentioned that methyl salicylate is extracted to the extent of 90 per cent. from oil of gaultheria, had Dr. Carmichael, in making up his prescription, inserted *oil of gaultheria* instead of methyl salicylate, no mistake would have been made, because that is a well-known drug, and is kept in stock by all chemists, and he would have got practically what he prescribed. It had been ascertained that Dr. Carmichael had accepted this oil of gaultheria instead of methyl salicylate, and it had been further ascertained that Dr. Carmichael recently applied to a well-known apothecary establishment in Glasgow for this methyl salicylate, and none being kept there, a small quantity was obtained from the makers of it, who are, it is understood, in Germany; but finding the price too expensive, Dr. Carmichael set to preparing it himself by fractional distillation—as described in his paper read to the Medical Society. No similar prescription by Dr. Carmichael had ever been presented at Mr. Kennedy's place of business. The only fault which his assistant committed was in not asking an explanation of what was meant by methyl salicylate. But it is a well-known fact that chemists were constantly in the habit of spelling out prescriptions by medical men, and I suppose, acting on this practice, the assistant supplied the one thing for the other. He did supply a salicylate, but not that of methyl. There was not the slightest suspicion of fraud in the case and no injury could possibly have been done to any one by the substitution of the salicylate of soda. It may be that according to the strict letter of Section 7 of the Sale of Food and Drugs Act, 1875, there was an infringement of the law, but in the very peculiar circumstances of this case, which I have explained, it would be a great hardship to inflict a penalty, and I therefore ask your lordship to deal as leniently as possible with Mr. Kennedy.

Mr. Ross contradicted Mr. Hay's statement that no

similar prescription had been presented to Mr. Kennedy before. Dr. Carmichael gave the same prescription to a patient on the Thursday preceding June 4, and it was dispensed in Mr. Kennedy's shop. It was in consequence of the medicine supplied on that occasion being discovered by Dr. Carmichael to be of the wrong sort that the prosecution arose. The colour of the two medicines, however, was quite different. Dr. Carmichael sent the same prescription to the Sanitary Inspector, who sent an officer to get it dispensed by Mr. Kennedy, and subsequently the prescription was presented at the Apothecaries' Company's warehouse, and a correct compounding of the specified ingredients was obtained.

The Sheriff remarked that assuming that Dr. Carmichael thought that the medicine could not be got in Glasgow, it was a curious thing for him to give the prescription. There was some semblance of a trap being laid for the chemists in such a proceeding.

Mr. Ross pointed out that the doctor had got the drug in the city previously.

Mr. Hays said the drug was only to be obtained from the Apothecaries' Company, and it had been specially manufactured by them to the order of Dr. Carmichael.

Sheriff Balfour, in giving his judgment, said he was left in the dark with regard to two particulars of the case which very much affected the gravity of the offence. The first particular was whether Dr. Carmichael, who made out this prescription, ever got this salicylate of methyl dispensed before in Glasgow. It appeared to be a drug of quite recent American origin, and had been introduced into this country about a year ago. Dr. Carmichael appeared to know well enough about it, but whether or not he ever got it dispensed in Glasgow prior to sending out this prescription is a point on which no information had been given. The other point that his lordship was left in doubt about was the real difference between the two ingredients—whether it is an injurious thing to dispense salicylate of soda instead of salicylate of methyl. From the samples of both drugs before his lordship, he saw they were quite difference in appearance. With these two elements of the case left out, he could only deal with the remaining element, which constituted a sufficiently grave offence on the part of the respondent. It appeared that after this prescription was sent to Mr. Kennedy, Dr. Carmichael sent out another prescription to the Glasgow Apothecaries' Company, and he got that prescription properly dispensed. The Glasgow Apothecaries' Company adopted the proper expedient, and in place of being in doubt as to what the salicylate of methyl was, and dispensing another article in its place, they very properly sent to Dr. Carmichael and got the salicylate of methyl from him. That was where the offence of Mr. Kennedy lay, and that was where his agent had very properly admitted that there was an offence. He would have inflicted a heavier penalty if he had been satisfied that this was a drug commonly known in Glasgow and dispensed all over the town; but from the fact of a well-known establishment like the Glasgow Apothecaries' Company not having it in stock, and requiring to send to Dr. Carmichael for it, it seemed that although it had been introduced in Glasgow for a year, its supply was an uncommon thing amongst chemists. It was perfectly clear that Mr. Slogie should have sent to Dr. Carmichael to ascertain what the drug was, and where it was to be had. He had no right to dispense salicylate of soda in its place. He would inflict a penalty of £4, without expenses.—*Glasgow Herald.*

Alleged Supply of Laudanum for Paregoric.

Mr. F. Price, district coroner, held an inquest this week, at Salford, touching the death of George Henry Dodd, an illegitimate child, five months old. According to the evidence, the deceased became unwell about a month ago, and his mother gave him some paregoric, which was purchased at the shop of Mr. Lucas, chemist, Broughton Road. On Friday last the mother sent a little girl for another pennyworth of paregoric, but instead of going to Mr. Lucas's shop, she went to Mr. Peatson's in Broughton Road. She was served by Mrs. Peatson, and a portion of the contents of the bottle was administered to the deceased by its mother. The deceased at once fell asleep, and not awaking, and the mother observing that he breathed heavily, gave him some brandy and water. The child was taken to a medical man, who gave him some medicine, but he died without recovering consciousness.

Mr. James Gray, surgeon, said the deceased was brought to him in a state of complete stupor. The pupils of the eyes were contracted, and the symptoms were those of narcotic poisoning. He applied stimulants without effect. The mother said she had given it something from a small bottle which she produced. In his (Mr. Gray's) opinion, the bottle contained laudanum, pure and simple. The bottle had evidently contained peppermint, and the smell of laudanum was, therefore, not so apparent.

A Juryman: Do you think the child has been poisoned?

Mr. Gray: That is quite evident.

The Coroner, in summing up, said the person who supplied the narcotic might be guilty of manslaughter for supplying laudanum instead of paregoric, but as Mrs. Peatson denied serving the laudanum, no criminal charge could be sustained on the evidence of the little girl.

The Jury returned a verdict "that the deceased died from an overdose of laudanum, inadvertently administered to him by his mother."—*Manchester Evening News.*

Poisoning by Chlorodyne.

On Tuesday morning Sir John Humphreys held an inquest at the Town Hall, Old Street, Shoreditch, on the body of John Berry, aged 33, newspaper reporter. Deceased suffered from heart disease, and was in the habit of taking chlorodyne to ease the pain. On Saturday night he took a dose and went to bed. About three o'clock next morning his wife heard him making a peculiar noise, and discovered that he was in an insensible condition. A doctor was sent for, but deceased expired a few minutes after his arrival. The doctor who made the *post-mortem* said death was caused by prussic acid, and in chlorodyne there was a certain amount of that acid.

The Jury returned a verdict of "Death by misadventure."

***[It is not quite clear upon what ground death in this case was attributed to prussic acid poisoning; at any rate, it is not the only conclusion that would be consistent with the facts as reported.—Ed. Ph. Journ.]

Chemistry in the Law Courts.

The Badische Anilin und Soda Fabrik v. Levenstein.

In the Chancery Division of the High Court of Justice, on Wednesday last, Mr. Justice Pearson delivered judgment in this case, which was commenced on March 5, and has been thirteen days before the Court.

The plaintiffs were a company incorporated in Germany, and were the owners of a patent taken out by them through their agent in England in the year 1878 for "improvements in the production of colouring matters suitable for dyeing and printing," and their claim was for an injunction to restrain the defendants, Messrs. Levenstein, who are manufacturers of materials for dyeing, from manufacturing, selling, or making any profitable use of any dyes or colouring matters being the same as the "Fast Blackley Red" sold by the plaintiffs, or any dyes or colouring matters made according to the plaintiffs' inventions, or by any process being a colourable imitation thereof. The questions which arose in the case were of great difficulty, and involved a considerable acquaintance with the technical language used in the science of chemistry. A fact of some public interest was stated during the hearing of this case, which was that the manufacture of chemicals used for dyeing purposes is almost entirely in the hands of Germans, who make immense profits by the sale in England of these

most necessary articles. The plaintiffs, by their specification, stated that their invention consisted in the production of red and brown colouring matters, in chemical language termed the "sulpho-acids of oxyazo naphthaline." They then described four simple processes for producing this result, and claimed as their invention the production of the colouring matters by any one of the processes so described. The first process was as follows:—Naphthylamine is converted into its diazo compound by the action of nitric acid and in a manner well known to chemists, and equal molecules of the diazo compound thus obtained and of naphthol, or naphthylic alcohol, are allowed to react upon one another, by preference in an alkaline solution, according to the employment of either of the two isomeric modifications of naphthylic alcohol known as alpha naphthol and beta naphthol; the result of this operation is a precipitate containing either of the two corresponding and isomeric modifications of oxyazo-naphthaline, and which may be termed "alpha and beta oxyazo-naphthaline" respectively. These azo-compounds are further converted into their sulpho-acids by any method now in use for the preparation of organic sulpho-acids, such as, for instance, by heating them with fuming sulphuric acid until the mixture is found to produce a clear solution with water. The excess of sulphuric acid may then be removed by any of the known means for effecting this purpose and the colouring matter may be obtained in a solid state by precipitation or evaporation. In this manner brown colouring matters are obtained from alpha oxyazo-naphthaline, and red colouring matters from beta oxyazo-naphthaline. An example of the manner in which the first process could be carried out was then given:—"About 10 lbs. of naphthylamine are mixed with or dissolved in about 2 gallons of concentrated or strong muriatic acid and about 100 gallons of cold water, and thereto an aqueous solution of nitrate of sodium is added, containing about $4\frac{8}{10}$ lbs. of pure nitrate of sodium, or as much as will be found necessary to convert the naphthylamine into its diazo compound, or into hydrochlorate of diazo-naphthaline. The solution thus obtained is added to an aqueous and strongly alkaline solution of about 10 lb. of either of the two isomeric naphthols, or of a mixture of the same, when a dark-red or brown precipitate will be produced, consisting of oxyazo-naphthaline, which is to be filtered, washed and dried. In order to obtain the sulpho-acids of oxyazo-naphthaline, about 10 lbs. of the oxyazo-naphthaline are dissolved in about 20 lbs. of fuming sulphuric acid, containing about 80 per cent. of anhydrous sulphuric acid, and the mixture is heated at a temperature of about 100° C. for about two hours, or until a sample of the mixture will be found to produce a solution with water. The further treatment consists in removing the free sulphuric acid contained in the mixture by any of the known means for effecting this purpose, such as, for instance, by neutralization with caustic lime, and the colouring matter may be obtained in a solid state, by preference in the state of a sodium salt in a manner well understood by chemists." The three other processes were then described, which in some respects varied from the first process. The objections raised by the defendants was that the specification did not sufficiently describe and ascertain the nature of the alleged invention, or in what manner the same was to be performed, and did not sufficiently distinguish which of the matters and things therein described were claimed to be new, and that the specification was in other respects vague and insufficient. In support of the plaintiffs' case, several witnesses learned in the science of chemistry were examined at considerable length, and in their evidence it was stated that the colouring matters for which the patent had been secured were capable of being produced by the different processes described in the specification. The defence, in support of which many scientific witnesses gave evidence, was principally to this effect—that it would be impossible to carry out the processes by the means stated in the specification, on this account, that if the oxyazo-naphthaline were to be united with the fuming sulphuric acid of the strength therein described, it would be dangerous to human life, and it was proposed that an experiment should be tried on a small scale in the presence of the Judge, for the purpose of explaining and proving the defendants' allegations. Mr. Justice Pearson having consented to this experiment being tried, an arrrangement was made for carrying it out in a separate room, and there could be no doubt that the process, as exhibited by the defendants, supported their theory, while the contention of the plaintiffs was that the experiment was not properly carried out. At the conclusion of the arguments and evidence on both sides, the learned Judge stated that he should not decide the case without having an experiment made by an independent scientific chemist appointed by the Court. In pursuance of this decision, Professor Roscoe was appointed by the Judge, with the sanction of all parties, and a report was made by him. After this report had been made to the Court and communicated to the parties, this further contention was raised. It was said by the defendant that he really and truly carried out his manufacture of the several articles by a totally different process from that described in the plaintiffs' specification, and that he was willing to communicate what he termed his secret process to the plaintiffs if they would undertake not to divulge it. The plaintiffs declined to give the required undertaking, and, after much discussion, it was proposed by the Judge and approved by the counsel on both sides that the secret process should be stated to the Court in private, and accordingly the arguments were continued for three days in the Court with closed doors.

In the course of an elaborate judgment Mr. Justice Pearson said: There could be no doubt that Mr. Levenstein was entitled to great praise for the knowledge and perseverance which had enabled him to carry out his process; he would even assume that the process might be conducted more easily and more cheaply than that adopted by the plaintiffs; but still it was only another method, by using well-known ingredients, of arriving at the same result. There was no dispute that, so far as the materials were concerned, Mr. Levenstein used the same, or he used equivalents for them, and taking all the circumstances into consideration he could not come to any other conclusion than that the plaintiffs were entitled to their injunction. He regretted very much to be obliged to decide against Mr. Levenstein, but the law compelled him to do so. He must, therefore, grant the injunction, and the defendant must pay the costs of the action.

Correspondence.

F. G. Foot.—(1) *Vicia sylvatica*; (2) *Vicia cracca*: (4) *Euphorbia amygdaloides*; (5) *Silene inflata*; (6) *Melittis melissophyllum*.

N. M. Grose.—*Salisburia adiantifolia*, the Japanese "gingko."

R. M. Lewis.—Your letter has been handed to the Secretary, to whom all notices of change of address should be sent.

T. P. Jones.—We believe a cement for fastening india-rubber on bicycle wheels is made by allowing 1 part of shellac to digest in a warm place in 10 parts of strong solution of ammonia until it becomes fluid.

J. Sharp.—The book is published by Messrs. Churchill.

F. W.—We think your object could be best secured under the provisions of the Trade Marks Act, which is printed in the Society's Calendar.

A. Rutter.—See an article in the *Pharm. Journal* for August 12 last, p. 123.

COMMUNICATIONS, LETTERS, etc., have been received from Messrs. Whitby, Kingzett, Kinninmont, Wilkinson, Hay, Senier, Harvie, Wells, Allan, Inquirer, Corniper, B. H. E.

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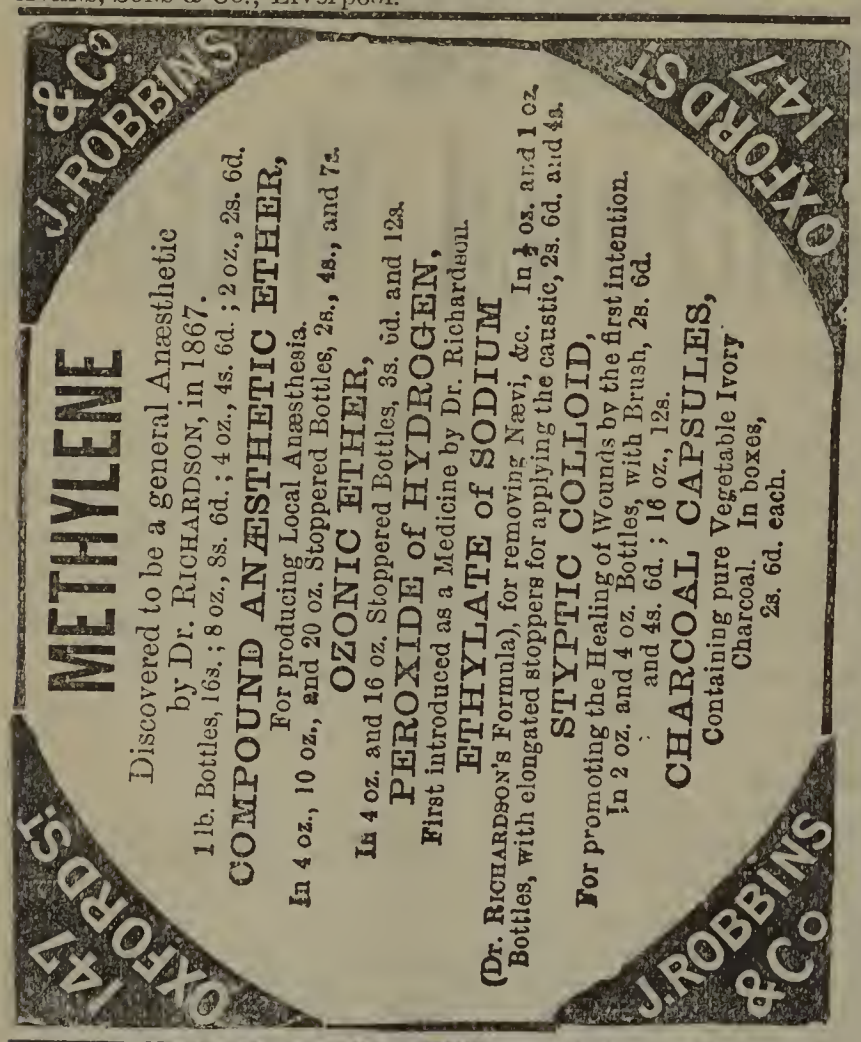

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For the Preliminary, Bell Scholarship, and Minor Examinations.—Fee for either class, Five Shillings monthly, or in one inclusive fee. There is no limitation to the number of lessons, and new ones are supplied by return of post. Entrance for the October, December and future examinations is now requested. For Prospectus of either, with a set of Minor questions of April, 1883, enclose stamped address to

Mr. H. JUDD,

WEST CENTRAL SCHOOL OF PHARMACY,

27, ARGYLE SQUARE, KING'S CROSS, W.C.

For Prospectus of Mr. Judd's Day and Evening Classes call, or write with stamp.

ENGAGEMENTS WANTED.

AS JUNIOR. Age 24. Height 5ft. 8in. Town and country experience. Disengaged July 8th. A. B., 54, Dynevor Rd., Stoke Newington, N.

TEMPORARY. From July 6 to 20. By Surgeon's ASSISTANT. Good Book-keeper, Dispenser, and accustomed to Chemist's Retail. S. C., 39, Leighton Grove, Kentish Town, N.W

ENGAGEMENTS WANTED.

AS Laboratory Assistant, with Manufacturing Chemist. Understands Practical Analytical and Pharmaceutical Chemistry. Holds State diploma from Germany, Switzerland, and France. Speaks the English, Swiss, French and German languages. Highest testimonials. Chemist, care of Goodlass, Wall & Co., Seel St., Liverpool.

TEMPORARY Manager or Assistant. Qualified. By the day, week or month. Town or country. Disengaged July 2nd. Chemicus, 51, Judd St., St. Pancras, W.C.

AS Assistant, Manager, or with view to succession. 10 years' experience. Age 25. Highest references. Minor and Hall's qualifications. Thomas, Messrs. Cousins & Co., Pharmaceutical Chemists, Oxford.

ENGAGEMENT. London preferred. Ætat. 21. 5½ years' experience. Minor qualification. Epsilon, 129, Dulwich Rd., Herne Hill, S.E.

AS Temporary Assistant or Manager. For either town or country. Experienced in Dentistry and Prescribing. Married. Good references. D., 19, Wandle Rd., Croydon.

AS Assistant. In a first-class Retail and Dispensing business. Age 21 years. Height 5ft. 11in. 5 years' experience. Highest references. Has had sole charge during the past 9 months. H. Ives, Apothecaries' Hall, New Buckenham, Attleboro'.

AS Temporary Manager. By day, week, or month. Disengaged July 3rd. M. P. S., 37, Milk St., Bristol.

AS Assistant. Varied experience and first class references. B., 129A, Lord St., Southport.

AS Temporary Manager or Assistant. Many years' experience in London and country. First class references. Disengaged. Chemist, Milton Villa, Hammersmith, W.

AS Assistant. In or out-door. Age 25. Nearly 10 years' good experience. Excellent references. W., Mr. T. Driffield, Chemist, Spilsby, Lincs.

AS Junior. In or near London. Time for study preferred. Age 20. Passed Preliminary. H. G. B., care of Mr. Barton, 1A, Moreton St., Pimlico, S.W.

AS Dispenser. Age 23. 8½ years' experience. Salary moderate. G., care of Mr. Cameron, 4, Vauxhall Row, Vauxhall, S.W.

IMMEDIATELY.—As Assistant, for permanency or temporary term. Age 26. Passed Minor. 10 years' good experience. Can Prescribe and Extract Teeth. M. A., 26, Clapham Rd., S.W.

AS Senior Assistant or Manager. First-class London and country experience. Out-door preferred. Age 29. A. P. S., 43, West St., Reading.

IN London (near Marylebone Rd.), where time would be given to attend lectures. Moderate terms. Good references. Age 21½. F. D., Mr. W. R. Wright, Chemist, 651, Rice Lane, Walton, Liverpool.

AS Assistant or Locum Tenens, by gentleman age 28. Height 5ft. 10in. Minor qualification. Disengaged. Please state salary, &c. Minor, Mr. Woods, Pharmaceutical Chemist, Warrington.

MANAGER of Branch. London or suburbs preferred. Married. Age 30. Minor qualification. Registered Dentist. Permanency required, would take temporary. K., 42, Glendish Rd., Bruce Grove, Tottenham.

AS Assistant. London preferred. 7 years' experience in good Dispensing and light Retail business. Age 23. Height 5ft. 10in. Argentum, Mr. Huckstadt, 87, Mansel St., Swansea.

AS Junior. Age 21. 5 years' experience. Disengaged. Alpha, 11, Gilbert St., Oxford St., W.

ENGAGEMENTS WANTED.

AS Manager. Temporary or permanent. 30 years' experience. Registered. Married. Good references. Understands Postal duties. Country preferred. J. M., 54, Croydon Grove, Croydon, Surrey.

IN London. As Junior Assistant. In a good Dispensing business. With a short time for study if possible. Age 22. Height 5ft. 9in. Good references. A. T. R., 12, Foregate, Worcester.

TO Manage open Surgery. Can see Patients, Prescribe, Dispense, keep Books, attend Midwifery, &c. Married. Ætat. 31. Excellent references. Strutt, 320, Brixton Rd., S.W.

UN Français. Aged 21. Gentlemanly appearance. Passed 2 examinations in Chemistry in France. With over 4 years' experience. 6 months in an English school. Speaks English pretty well. Requires engagement as Assistant at an English and French Chemist's. London or suburb. Excellent references. Moderate salary. A. Lepetitpas, Grove House, Highgate, London, N.

AS Junior or Improver. Indoor. 3 years' experience. Disengaged shortly. London preferred. J. T., 2, Idmiston Ter., Idmiston Rd., Forest Lane, Stratford, Essex.

AS Manager of Branch. At once. 15 years' experience in town and country Dispensing and Prescribing. Minor qualification. Age 30. 5ft. 10in. Statim, 61, Bousfield Rd., Nunhead, S.E.

BY Junior. In town. Where 2 or more are kept. Age 21. Height 5ft. 8in. 6 years' experience. Good linguist. H., 199, King's Rd., Chelsea, S.W.

L. HAVING French and English experience in Pharmacy, speaking French, is open to an engagement in South France. Paris preferred. L., Maison Bourtayre, Rue des Ecoles, Biarritz, France.

AS Assistant. Highest references. Height 5ft. 8in. Thoroughly experienced. Married. E. S., 50, Macfarlane Rd., Shepherd's Bush, London, W.

TEMPORARY. Ætat. 31. Town or country. By day or week. Thoroughly experienced in all branches. Irreproachable references. Moderate terms. Now at liberty. A. Wood, 7, Woodfield Cres., W.

AS Assistant. Accustomed to first-class Retail and Prescribing. Long experience. London preferred. Highest references. M., 226, Marylebone Rd., London, W.

A QUALIFIED German and French Assistant wishes employment in an English Pharmacy. Irreproachable references. J. R. Moechel, 23, Duke St., Grosvenor Sq., Salary no object.

OUT-DOOR or to Manage a Branch. Age 37. Height 5ft. 9in. Good address. Registered. First-class testimonials. Mixed country trade preferred. G. B. G., 27, Argyle Sq., W.C.

ASSISTANTS WANTED.

ARTICLED Pupil.—An Analytical Chemist has a vacancy in his laboratory for a well educated gentlemanly youth as articled Pupil. Good opportunity for obtaining a scientific and practical training. Address, Dr. T., 208, Upper Parliament St., Liverpool.

JUNIOR Assistant. In-door preferred. To Manage a small branch shop. Address, with reference, salary required, and other particulars, Pharmaceutical Chemist, 55, Grafton St., Oxford Rd., Manchester.

IMMEDIATELY.—An Assistant, accustomed to a good class country business, Retail and Dispensing. Must be well recommended. Apply, stating age, salary required, &c., to Mr. Ellwood, Chemist, Leominster.

ASSISTANTS WANTED.

APPRENTICE.—W. W. Clark, Pharmaceutical and Family Chemist, Dorking, has a vacancy for a well educated gentlemanly youth as an Apprentice. A comfortable home and every opportunity for acquiring a thorough knowledge of the business. Particulars on application.

APPRENTICE.—In a good country town, by a Pharmaceutical and Family Chemist. Comfortable home. Easy hours, and no Sunday duty. Address, J. T., 16, Market Sq., Aylesbury.

APPRENTICE.—A vacancy occurs for a well-educated Youth in one of the oldest established businesses in Surrey. This is a good opportunity for one seeking a healthy locality with home comforts, and acquiring a thorough knowledge of Dentistry. For terms apply, Edward Barnes (late G. Christian), Chemist and Dentist, High St., Godalming.

APPRENTICE.—Advertiser has vacancy for a well educated gentlemanly Youth, for a term of 3 or 4 years, in a Dispensing and Family business. Every facility for obtaining thorough knowledge of business. Comfortable home. Healthy and pleasant neighbourhood. Premium moderate. Apply, Walker, Seacombe, Birkenhead.

A GOOD Junior Assistant, in-door, For the Retail in a Mixed business. No Sunday duty. Comfortable home. Liberal terms to a reliable young man. State age, height, salary required, and give references and full particulars in first letter, enclosing photo. if possible, to W. Kemp & Son, Wholesale and Retail Chemists, Horncastle.

A RELIABLE Junior, accustomed to Mixed country trade with Dispensing and Prescribing. Must be energetic and obliging, with pleasant address. State full particulars, with photo. if convenient, to Randal How, Chemist and Dentist, 26, St. Clement's, Oxford. Also a vacancy for an Apprentice.

IMMEDIATELY.—An Assistant (Minor), of good appearance and address, for Dispensing and light Retail business. Apply, stating reference and other particulars, and enclose carte de visite, to H. Wilkins, 357, High St., Cheltenham.

A STEADY and industrious Junior in a light Retail and Dispensing. Time for study and recreation. Apply, stating age, salary required, and reference, to Joseph M. Lucas, Chemist, Gravesend.

MANCHESTER.—Wright & Barnaby, Pharmaceutical Chemists, 223, Oxford St. (near Owens College) require an in-door Assistant, about 23 years of age. Must be a competent Dispenser, and neat writer. State age, height, salary, when at liberty, and enclose carte.

IMMEDIATELY.—Junior Assistant, with time for study. State age, height, and salary required, carte also if possible (to be returned), to Herbert Lovely, 12, The Mall, Ealing.

A GOOD Junior, accustomed to Dispensing and willing to make himself useful in a Mixed Family trade. State age, experience, reference and salary required. Indoors. Enclose photo. if convenient (which will be returned). J. Fawcett, New Ferry, Birkenhead.

A GOOD Junior Assistant, who has been used to a Dispensing and light Retail. Apply to M. Taylor, English and Foreign Chemist and Dentist, 105, Regent's Park Rd., N.W.

AN Assistant. With good Dispensing experience and Minor qualification. Apply to Bradley & Bourdas, 6, Pont St., Belgrave Square, S.W.

JUNIOR Assistant, wanted about the middle of August, who understands Postal and Telegraph business. Apply, stating salary required, to Chemist, 50, Queen's Rd., Brighton.

ASSISTANTS WANTED.

THE Hospital for Women, Soho Square.—Dispenser. Non-resident. Experienced. Must give his whole time. Salary £100 per annum. Candidates to apply to the Secretary, at the Hospital, on or before 14th July.

PARIS.—Qualified Assistant. Accustomed to first-class London trade. Of gentlemanly address. Tall. Age about 30. A good salary is offered for corresponding advantages and speaking French. Apply to L., 1, Southwick St., Hyde Park Sq., for all particulars.

AN Assistant. Accustomed to a light country Retail. Age about 22. Must be thoroughly steady. No Sunday work. Apply, with all particulars, to J. Marson & Son, Stafford.

IMMEDIATELY.—Improver or Junior Assistant. Accustomed to ordinary country trade. Time for study. Apply, stating references, salary, age, height, &c., to Mr. D. Jenkins, Chemist, Bridgend, Glamorgan.

A JUNIOR Assistant. Apply, stating age, height, salary, references, &c., to John Evans, Chemist, Bristol.

AN Assistant for a light Retail and Dispensing business. About 22 years of age. Churchman preferred. An accurate Dispenser. State height and salary required to M., care of Messrs. Hodgkinson, 198, Upper Whitecross St., London.

IMMEDIATELY.—An active and obliging Junior. Accustomed to a country trade, with ability to Dispense, and having satisfactory references. Hours of business light, and no Sunday duty. Apply, with usual particulars, to W. Smith, High St., Abingdon.

A DISPENSING Assistant. Accustomed to first-class business. Not under 24 years of age. Address, with carte and usual particulars, D., care of Barron, Harveys & Co., Giltspur St., London, E.C.

AS Junior. Accustomed to a good light Retail country business. Two kept. Send age, height, salary, reference, &c., also carte (to be returned), to John Rae, Chemist, Newmarket.

A COMPETENT Assistant. Immediately. Not under 25. Able to take Management in general country business. To board in but sleep out of house. Junior kept. Address, with full particulars to T. M., Hearon, Squire & Francis, 5, Coleman St., London, E.C.

CHILDREN'S Hospital and Dispensary, Gartside St., Manchester.—A Dispenser, who has passed the Minor examination of the Pharmaceutical Society or Hall. Salary £93 per annum. Applications, with testimonials, to be sent to the Secretary, Gartside St., on or before July 10.

IMMEDIATELY.—A Junior Assistant. Out-door. One accustomed to mixed Retail business. Address, stating age and salary required, with references, to S. P. Bostock, Market St., Hyde.

TWO Assistants for a good Dispensing business. Apply, with the usual particulars, D., Messrs. Evans, Sons & Co., Hanover St., Liverpool.

R. WILLIAMS & CO., Homœopathic Chemists, 40, Old Steine, Brighton, require an Assistant.

ASSISTANTS.—Senior and Junior. In-door. Hours easy. Duties light. Every family comfort. State salary required, references and usual particulars, Fowke & Son, Pharmaceutical Chemists, Stafford.

JUNIOR or Improver. Apply to 155, High St., Stoke Newington.

IMMEDIATELY.—Assistant. About 21. Where several are kept. Must be used to good Family business, quick, industrious, reliable, and of good moral character. Hours not very long. State salary required and full particulars. M. & N., care of Messrs. Burgoyne & Co., 16, Coleman St., E.C.

ASSISTANTS WANTED.

PARIS.—Junior. Immediately. In-doors. Salary to commence 70 francs a month, after 6 months 100 francs. Apply Wilcox & Co., 239, Oxford St., London, W.

WHOLESALE.—An experienced Invoice Clerk. Immediately. Apply. with full particulars, to H., care of Messrs. Meggeson & Co., Miles Lane, London, E.C.

IMMEDIATELY.—By Goode & Son, Pharmaceutical Chemists, Congleton, an indoor Junior Assistant. Must be a quick and accurate Dispenser, and willing to make himself generally useful in a Family and Mixed country trade. State age, height, and salary required. Send photo. Good references indispensable. One seeking a permanency preferred.

JUNIOR. In good seaside business. Must be able to Dispense. Hours, summer, 7.15 to 8; winter, 7.45 to 7. No Sunday duty. Must be well recommended. State name and address of reference, age, height, and salary required. C. F. Smart, Chemist and Stationer, Littlehampton.

AT once.—An Assistant. Single. Out-doors. For a Mixed business. Able to Extract Teeth. Good Counterman. Reference from last employer. Applications not answered within 3 days declined. Apply, Joseph Wood, Chemist, 18, Bridgehouses, Sheffield.

A GOOD Assistant. About 22 years of age, who has been accustomed to first-class business and can be well recommended. In application, please state all the usual particulars, including references and salary required, also enclose carte (to be returned) to Chemist, 14, Highbury Park, London.

AN Assistant. In-doors. About 21 or 22 years of age, to take entire charge of the books, and assist in the shop. Must be gentlemanly, a good Counterman, have unexceptional references as to steadiness, and have been used to a Mixed country business. Apply, stating age, height, salary required, and enclosing carte, to J. Wellington, Chemist, Oakham.

AN Assistant. Well up in Dispensing and light Retail. Of good address. State salary, references and full particulars to John Ing, Aldeburgh-on-Sea, Suffolk,

FOR London Suburb. — Married Assistant. Age about 30. Must be thoroughly competent, active, and energetic, and of good address and appearance. Salary commence, £10 per month with unfurnished apartments. Must have first-rate character, and be abstainer or strictly temperate. State qualification, height, age, and number and age of children, and give usual business details. Enclose carte (to be returned). Letters not answered consider declined. To A. X., Messrs. Sanger & Sons, 489, Oxford St., W.

FOR a healthy station in India.—A qualified Assistant. Not over 30. One accustomed to Mixed country business, with some London experience preferred. Salary on 3 years' agreement. In-doors. Rs. 1000, 1200 and 1400, with good prospects and free passage both ways. T. H. W., Idris & Co., Ascham St., London, N.W.

AN Assistant who has passed the Minor. Not under 24 years of age. Apply, Messrs. Probyn & Co., 55, Grosvenor St, W.

JUNIOR Assistant. To take charge of small business. Ample time can be made for study, but lectures cannot be attended. Salary £24 to £30 (indoors), according to experience. Send photo. State age, height, &c., to Skinner, Chemist, 37, Vestry Rd., Peckham Rd., S.E.

IN a fortnight. An Assistant for a seaside business. Age 26 to 27. Unmarried. Must be an accurate Dispenser, steady and obliging. Good references indispensable. One seeking a permanency preferred. A liberal salary given to a suitable man. Usual particulars to C. Amoore, Pharmaceutical Chemist, Hastings.

ASSISTANTS WANTED.

A GOOD Junior Assistant. Active and industrious. Apply, stating age, references, salary, &c., to Thos. W. Horsley, Pharmaceutical Chemist, 274, Portobello Rd., Notting Hill.

AN Assistant for the Dispenser Counter, who has been accustomed to first-class business. With Minor qualification. Age about 24 years. Two Assistants kept. In-doors. Apply, with full particulars, to John Sargant, Reigate, Surrey.

A GOOD Junior. About 21 or 22. Personal application preferable; if by letter enclose photograph; to J. W. Taplin, 13, Desborough Pl., Harrow Rd, W.

AN Assistant. Minor qualification. Age about 23 or 24. Liberal salary. Apply to Vines & Froom, 75, Aldersgate St., E.C.

MESSRS. LONG & SON, 2, Western Pl., Hove, Brighton, require an Assistant, capable of Managing a light Retail and Dispensing business. Indoor. State usual particulars, and enclose carte, if convenient.

AN Assistant, with Minor qualification. Apply with full particulars to Glaisyer & Kemp, Brighton.

AN Assistant. Accustomed to a good country trade. Must be a good Dispenser, and well up in his business. Not under 25. With good references from last employer. One seeking a permanent situation preferred. State age, height, salary required, and enclose carte (to be returned), to Mr. R. B. Sandiland, Bicester, Oxfordshire.

BUSINESSES FOR DISPOSAL.

IN a populous district (18,000 inhabitants). Opened a year and 10 months. Returns for that period £450, giving an increase over last year of £40. Rent for house and shop £25. Shop well fitted. Two plate-glass windows. Mahogany-fronted drawers. Owing to the proprietor being compelled to leave the neighbourhood, will accept £250, which is really a bargain. Alpha, 21, Salem Hill, Sunderland.

TO Chemists and others.—Immediately. The lease, goodwill, and fittings of a commodious shop and adjoining 6-roomed house that has been carried on as a Chemist's and Surgeon's for some years past, and situated in one of the main thoroughfares in the East End. A small premium only required from an immediate purchaser. For further particulars, apply to T. S., care of Messrs. Burgess, Willows & Francis, 101, High Holborn, W.C.

LONDON, N.—Small Retail, Dispensing, and Prescribing. Returns £350. Annual increase £50. Good stock and fittings. Rent £55. Serious illness of proprietor necessitates immediate disposal. Valuable Proprietary Articles, whose sale is rapidly growing. Price, including about £50 worth of household furniture, £300. Apply to Mr. Wilson, 60, Ludgate Hill, E.C.

£300.—A Drug Business, stock, fixtures, &c. In a thriving town in Lancashire. Proprietor leaving for health's sake. 9 years in same hands. Enquire by letter, Mr. R., 22, Hall Grove, Hyde Park, Leeds.

AN old established Business. In one of the best market towns in Herefordshire. Situated in a commanding position in the main street. Returns £550; increasing yearly. Capitally stocked with good and saleable Drugs and Patents. A thorough going and genuine concern. Modern built house. Private entrance. Very convenient. Rent of house, shop, and warehouse, £30. For further particulars apply to Viator, Beech Villa, Queen St., Wellington, Salop.

BUSINESSES FOR DISPOSAL.

AËRATED Water Business, &c., including a good Speciality in increasing demand. Comfortable house attached to factory, with long lease, at moderate rent. Owing to continued ill-health of proprietor the whole will be sold by valuation or private contract. Apply, R. Lake, 45, Gibbons St., Plymouth.

AN old established well-known Dispensing and Retail Business of 50 years' standing. In one of the main thoroughfares of London, N. Situated in a commanding position. An excellent opportunity for an enterprising man. The house and shop are in a good condition. Held on an original lease, of which there are 32 years unexpired. Rent £60. Extensive stock. Good class trade. Full prices, and very profitable. Price, inclusive, £900. Proprietor retiring. Address, Œdipus, Messrs. Barron, Harveys & Co., Giltspur St., London, E.C.

A RARE opportunity for an energetic man of business, accustomed to high class trade.—A Branch Business. Situate in a valuable position in leading thoroughfare of a most charming, salubrious, and aristocratic suburb of London. The house contains 5 bed rooms, drawing room with folding doors, parlour, 2 kitchens, 2 coal cellars, &c. Splendid back view from garden and windows. This business, with a slight alteration, at a cost of about £60, could be made the leading Dispensing establishment in the town, with a comparative small capital. Lease 18 years. Rent £60. Taxes £12. Let off about 40 guineas. Tenants will remain. Price £450. Apply, personally, to Mr. Walton, 204, Haverstock Hill, London. Proprietor retiring from Retail.

CHEMIST'S cash Retail Business. Good stand. Opposition small. Good prices realised. Returns £8 per week. Rent £36. On seven years' lease. Can let off £20. Post Office attached; value about £40. Proprietor taken another in the country. Price £300. Part can remain. Fides, Woolley, Sons & Co., Manchester.

DISPENSING and Photographic Business. In the West of England. Returns rapidly increasing. Handsome double-fronted shop and house. Long lease. Price £750. Most satisfactory reasons given for disposal. Stephens, care of Evans, Lescher & Webb, 60, Bartholomew's Close, E.C.

DENSELY populated town, near London. Handsomely fitted shop. In excellent position of great thoroughfare. Opposite busy station. Lease. Side entrance. Returns last year, £60; this year, £64 10s. per month, and capable of great increase. Price £700. Opening for Dentist. Alpha, Sanger, 429, Oxford St., London, W.

103 BOROUGH, High St., S.E.—Notice of Sale by Auction of the old established Chemist's and Druggist's Business (ate Willmott's), by order of the proprietor, who is retiring. Mr. J. Kemp Coleman will Sell by Auction the above Business as a going concern, on Thursday, 5th July, 1883, on the premises, at 2 o'clock precisely, in one lot, which includes the valuable Lease (20 years unexpired), the Goodwill, Stock and Fixtures, also the well-known Proprietary Articles attached to this establishment. This business has been carried on as a Chemist's and Druggist's uninterruptedly for over 60 years. Particulars and Conditions of Sale may be had of J. Tickle, Esq., Solicitor, 4 and 5, Grocers' Hall Court, E.C.; Messrs. Orridge & Co., 32, Ludgate Hill, E.C.; on the Premises; and of Mr. J. Kemp Coleman, Auctioneer, 120, High St., Poplar, E.

A FRENCH Pharmacist having an old established Business at the West End desires, after 27 years' occupancy, to retire. Returns average £900. Net profits £400. An English Chemist, speaking French, will greatly increase returns. £700; half could remain. Principals only need apply. Pharmacie, 129, Holland Rd., Kensington.

BUSINESSES FOR DISPOSAL.

MESSRS. GURDEN BERDOE have for transfer:—Hants. Old established Retail and Dispensing Trade. Returning £500. Handsome shop. Large house. Only £350, or offer. Another. Showing £600 net profits. For £1600, or offer. Sussex. Retail and Prescribing. Nothing heavy. Returning £700. For £400. Wilts. Good market town. Splendid house and garden. Rent £38. Returning £350. Offer. London, W. Elegantly fitted corner Dispensing Trade. Returns £500 by manager. Offer. Camberwell. Same hands 14 years. Returning £350. Nice house and garden. £300. E. Profitable Retail and Prescribing Trade. Returning £6 weekly. Only £100. Kilburn. Handsomely fitted Retail. Now neglected. Increasing position. Only £85. Less than value. Please apply, 30, Jewry St., Aldgate, City.

EXCELLENT opportunity. — Chemist's Business, where good class trade is done, chiefly Dispensing. To be sold at considerably less than value of fittings, on account of owner going abroad. Situated in the fashionable neighbourhood of Clifton. T. Milton, Chew Magna, near Bristol; or J. Milton, 451, Cold Harbour Lane, London, S.W.

IMMEDIATELY.—An improving Retail and Prescribing Business. In a thriving Lancashire town. Good commanding position. Very pleasant neighbourhood. Price £140. Apply, J. Head, Millgate, near Rochdale.

WANTED TO PURCHASE.

A GENUINE Dispensing Business. Returning about £1500 or £2000 per annum. Good house. London preferred. A Partnership in the Wholesale not objected to. Alpha, care of Messrs. Hearon, Squire & Francis, 5, Coleman St., E.C.

TO BE LET.

FOREST Gate.—On lease, a double fronted Shop, of good elevation. At the junction of five roads. Suitable for good Chemist or Open Surgery. Rent £50 per annum. Small premium required. Apply to Mr. E. J. Gale, Auctioneer, &c., 4, Cobbold Rd., Forest Gate, E.

In Liquidation.

To Chemists & Druggists' Sundrymen & others.

EDWARD THOMAS COLLINS is instructed to dispose of the whole of the valuable and well assorted Stock-in-Trade pertaining to the estate of Curry, Lloyd & Co., of Bath St., Bristol, Chemists and Druggists' Sundrymen, in liquidation, by Tender, in one lot, together with the large and extensive connection attached to the business, which has been established for many years.

The stock, amounting to about £2140 10s. 4d. at cost or stock book prices, may be viewed, with inventories and conditions of sale, on the premises, at Bristol, on and after Monday, 25th inst., to the day of sale.

Terms of payment cash.

The premises are admirably adapted for continuing the business, and an exceptional opportunity now presents itself of acquiring an old established business, to which a valuable connection in surgical appliances and manufacture of trusses is attached, which, with a moderate capital, may be continued and extended.

Tenders addressed to the Broker at the offices of the Bristol and West of England Merchants' Association, 39, Broad St., Bristol, endorsed, "Tender for Curry, Lloyd & Co.'s stock," will be received up to 2 o'clock on Thursday, the 5th July, when they will be opened in the presence of those who may attend.

Dated 21st June, 1883.

FOR SALE.

DISPENSING Screens, 5ft., 6ft., 7ft., glass case at each side, with silvered glass centre, with marble slab in front, silvered plate-glass centre, with carved wood on top, 3ft. high, the cases at each side plate-glass doors, with tablets on top, inside case fitted with silvered glass and shifting shelves, £7 10s.; as fig. A 53, 5ft. 6in. long, 8ft. long, 7ft. 6in. long; as fig. A 54, 4ft. long; as fig. A 55, 5ft. long, 6ft. long, 7ft. 6in. long; Sponge Cases, A 41, 65s.; A 43, £5; a Centre Case, 8ft. long, 5ft. wide, mahogany, £10, worth double; a number of other size Screens and Cases, very cheap. E. NATALI, 207, Old Street, near Pitfield Street, London, E.C.

20FT., 18ft., 14ft., 8ft., 7ft., 6ft., 5ft. mahogany-top Counters, fitted with drawers; 12ft. mahogany fronted Counter; 6ft. mahogany fronted Counter; two 10ft. Side Counters, fitted with drawers and cupboards, suitable for store-room; 14ft. mahogany and plate-glass fronted Counter; 7ft. do. do.; 7ft. 6in. long, 3ft. 6in. high mahogany and glass Cupboard; a 6ft. long, 3ft. wide Side Counter, fitted with drawers; a quantity of Shelving, Cupboard Doors, &c., suitable for fitting store-rooms, a bargain. E. NATALI, 207, Old Street, near Pitfield Street, London, E.C.

PLATE-GLASS Counter Cases, as fig. A 2, 3ft. long, 4ft. long, 4ft. 6in. long; as fig. A 3, 3ft. long, 40s.; 3ft. 6in. long, 45s.; as fig. A 6, 4ft. long, 5ft. long, 6ft. long; as fig. A 7, 3ft. 6in. long, 6ft. long; as fig. A 8, 5ft. long, 6ft. long; as fig. A 13, 4ft. long, 4ft. 6in. long; fig. A 15, 6ft. 6in., 7ft., 8ft., and 9ft. long; A 16, 3ft., 3ft. 6in., 4ft. long; A 17, 4ft. and 4ft. 6in. long; A 18, 5ft., £6; 6ft., £7; 7ft. 6in., £8; 9ft., £10; Tooth Brush Cases, A 9, 35s.; A 10, revolving front, 50s.; Desk and Cases, fig. A 30, 2ft. 6in. long and 3ft. long; A 31, 65s.; Cigar Cases, A 34; Bottles, Jars, Specie Jars, Carboys, &c., bargains. E. NATALI, 207, Old Street, near Pitfield Street, London, E.C.

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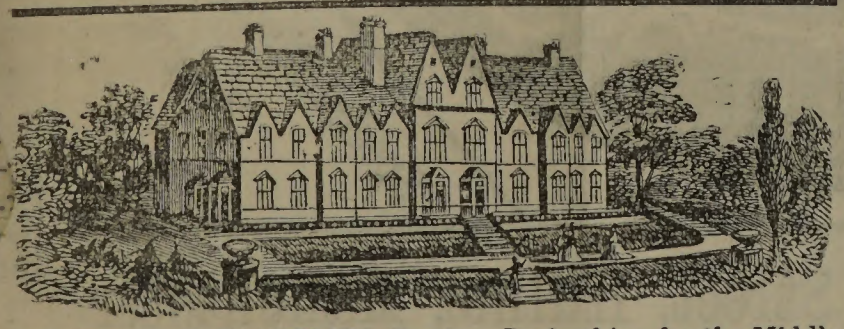

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